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BY- CHALFANT, JAMES C.

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THE PURPOSE OF THE STUDY WAS TO DETERMINE THE ECONOMIC AND DEMOGRAPHIC FACTORS UNDERLYING PUBLIC PROVISIONS FOR EXCEPTIONAL CHILDREN IN 101 ILLINOIS COUNTIES (COOK EXCLUDED) AND TO DEVELOP A DIAGNOSTIC TECHNIQUE TO INDICATE WHETHER COUNTIES COULD BE EXPECTED TO MAKE SUCH PROVISIONS. SERVICES STUDIED WERE THOSE FOR THE DEAF, THE SPEECH HANDICAPPED, THE EDUCABLE MENTALLY HANDICAPPED, AND THOSE OF A DIRECTOR OF SPECIAL EDUCATION. THE PROPORTIONS RECEIVING EACH SERVICE WERE DETERMINED, AND 21 ECONOMIC AND DEMOGRAPHIC CHARACTERISTICS WERE REDUCED BY FACTOR ANALYSIS TO SIX CLUSTERS OF VARIABLES. THE URBAN FACTOR ACCOUNTED FOR 44 PERCENT OF THE VARIANCE, EDUCATION FOR 13 PERCENT, SOCIOECONOMIC STATUS FOR 8 PERCENT, RURAL OCCUPATIONS FOR 6 PERCENT, FINANCIAL ABILITY FOR 5 PERCENT, AND POPULATION GROWTH FOR 4 PERCENT. A SINGLE INDEX SCORE WAS OBTAINED FROM THE FACTOR SCORES AND USED TO RANK THE COUNTIES. PROVIDING SERVICES FOR DEAF CHILDREN WERE NINE OF 12 HIGH EXPECTANCY COUNTIES, FOR THE SPEECH HANDICAPPED 62 OF 67, FOR THE EDUCABLE MENTALLY HANDICAPPED IN ELEMENTARY PROGRAMS 59 OF 63, AND FOR THE EDUCABLE MENTALLY HANDICAPPED IN SECONDARY PROGRAMS FIVE OF NINE. OF 24 HIGH EXPECTANCY COUNTIES, 17 HAD THE SERVICES OF A DIRECTOR OF SPECIAL EDUCATION. THE STUDY, THEREFORE, IMPLIED THAT LEGISLATIVE OR ADMINISTRATIVE PROVISIONS SHOULD BE BASED ON THOSE FACTORS RELATED TO THE SUPPORT OF SPECIAL EDUCATION SERVICES AND DEVELOPED AN EXPECTANCY INDEX TO SERVE AS THE MEANS OF STUDYING COUNTIES IN TERMS OF THOSE FACTORS. A 17-ITEM BIBLIOGRAPHY, APPENDIXES OF FACTOR AND INDEX SCORES PER COUNTY IN SERVICES FOR THE DEAF, AND 20 FIGURES AND TABLES ARE PROVIDED. THIS DOCUMENT IS AVAILABLE FROM THE COUNCIL FOR EXCEPTIONAL CHILDREN, NEA, 1201 16TH STREET, N.W., WASHINGTON, D.C. 20036, FOR $2.00. (DF)

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by James C. Chalfant

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Factors Related to Special Education Services

James C. Chalfant
Assistant Professor, Institute for Research on
Exceptional Children, University of Illinois

This monograph was adapted from the author's doctoral dissertation completed under the direction of James J. Gallagher, University of Illinois.

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1

Introduction

The great majority of parents, teachers, school administrators, and members of boards of education have long been aware of the need to provide special education services and facilities for children who are unable to learn in the regular classroom environment. Despite the fact that the need for special education programs is widely recognized, there are many handicapped children in attendance at school districts where special education programs are not provided.

Dunn (1963) reported that, during the 1957-1958 school year, only 31 percent of those needing special education were receiving it in the public schools, and an additional 5 percent were being served by private agencies and schools. Mackie (1965) reported that the percentage of children requiring special education in relation to those receiving it varies considerably from one area of exceptionality to another. About one-half of the children who are speech handicapped or visually impaired have access to special education programs, whereas only about 8 percent of the seriously emotionally disturbed and socially maladjusted receive special education services. About one-third of the mentally retarded are reported in special classes.

The low proportion of handicapped children receiving special education services raises serious questions regarding the reasons why public school administrative units have provided for less than one-third of the children needing these services. At the present time, there is little objective evidence concerning the factors that contribute to the presence or absence of special education programs in the public school setting.

Purpose of Study

The purpose of this study was (a) to determine the nature of economic and demographic factors underlying public school provisions for exceptional children in Illinois counties and (b) to develop a diagnostic technique to indicate whether or not counties could be expected to provide special education services.

Background

The responsibility for establishing a public school system is a state function and rests with the state legislature. Control and operation of the public school system, however, have been delegated to the people of the state. In most states, the school district has been created as the basic administrative unit for public education, with the function of providing educational opportunities for school age children within its geographic boundaries.

In discussing the development of and the need for effective school districts, Fitzwater (1957) places the beginnings of local school district organization in Massachusetts, in 1647, when a law was enacted which required towns to establish and support schools.

> Later, as small settlements spread out from the towns and demanded their own schools, the town system was abandoned. In its place was created the common school district system which resulted in forming a new district wherever another school was needed. This system subsequently spread with the westward migration and became the most prevalent type of school district organization in most sections of the Nation (p. 4).

Many midwestern states adopted the township system but later abandoned it in favor of the school district system.

Because state legislatures permitted the establishment of local districts whenever needed, the number of school districts increased correspondingly with the rapid increase in population. Unfortunately, thousands of these local school districts consisted of rural, one teacher schools, which provided limited educational opportunities and proved inefficient as administrative units.

The District Reorganization Movement. Probably no single social change has had a greater impact on school district reorganization than the transition from a predominantly rural economy to a higher urban, industrialized economy. Between the years 1920 and 1950, while the total population of the United States was increasing by nearly two-fifths, the trend toward urbanization reduced the rural farm population by one-fourth (Fitzwater, 1957). The population shift from rural to urban areas has created problems for the public schools in town and country alike. Migration to large metropolitan centers, for example, has resulted in increased school enrollment. As the metropolitan school district grows larger, the administrative problems of operating the metropolitan district increase in complexity and may create a need for decentralization. In the rural areas, however, the lack of pupils and an inadequate tax base make the need for centralization even more evident.

Confronted by widespread social and economic changes and the steadily increasing demand for more and better education, the public schools were forced to make adjustments to fulfill their responsibility. In order to create more efficient and effective administrative units, states have attempted to reorganize small districts into larger districts through consolidation. This has been done by legislative decree, through local initiative, and by means of planned reorganization programs of a permissive nature.

Considerable progress has been made in district reorganization. In 1932, there was a total of 127,244 districts in the nation (Deffenbaugh & Covert, 1933). By 1953 the total number had been reduced to 66,472 districts (Dawson & Ellana, 1954). While progress has been made in many states, the reorganization problem continues to exist.

Illinois, with all its wealth and natural resources, provides an excellent example of the reorganization problem. For many years Illinois had more school districts than any other state. In 1945, Illinois had 11,955 school districts, but by 1962 that number had been reduced to 1,511 districts (Illinois Legislative Council, 1963). Despite the extensive reorganization, 38 percent of the 1,511 districts had an average daily attendance of 100 pupils or fewer.

McLure's (1956) analogy strikes at the central core of the reorganization problem in many states—the lack of statewide, coordinated planning:

> Illinois is a good example of a state where reorganization of local districts has been completely "grass roots" process within permissive law. And like a prairie fire it has made a spotty path across the state, leaving large areas untouched. Others were passed by in haste and left as inappropriate territory for adequate districts. The state central office was not given authority to exercise the leadership of umpire for state-wide planning and designing, or tempering extreme localism in the interest of better results in the end. The result is somewhat akin to what one observes sometimes in a crowded parking lot that is not carefully supervised. Some early-comers park their vehicles across other people's rightful space, and the late comers find slots too narrow for appropriate use (pp. 105-106).

The first task in any kind of coordinated planning is to clearly define the goal to be achieved. If the goal of district reorganization is an efficient and economical administrative unit for public education, criteria are necessary to define the variables constituting such a unit.

Criteria for Desirable Administrative Units. A usual policy in describing the characteristics of desirable local administrative units has been the development of general criteria. Typical of these criteria are such things as (a) minimum and maximum pupil enrollment, (b) sufficient size for competent administrative and supervisory services, (c) the capability to provide other specialized services, and (d) maximum time and distance for pupil travel.

In 1938 the Educational Policies Commission of the National Education Association listed six criteria: (a) an administrative area large enough to make possible the employment of competent administrative and supervisory service without adding unduly to the cost of the program; (b) a minimum of 10,000 to 12,000 pupils in order to provide the essential administrative services and to develop a complete program of education at a reasonable cost per pupil; (c) a unit large enough to supplement locally the foundation program guaranteed by the state; (d) a minimum travel distance requiring not more than two hours a day travel time; (e) a unit so related to other government units that maximum cooperation between the schools and other social agencies is feasible; and (f) a unit representing a natural social and economic unit in which all members of the community may participate.

A similar recommendation was made by the National Commission on School District Reorganization (1948), which listed administrative, supervisory, and other specialized services, as well as enrollment figures of 10,000 to 12,000 students.

The New York Education Conference Board (1956) identified seven key conditions essential for good education in local school districts. They found that:

1. Our very small districts must look to better organization and leadership.
2. Our adequately organized districts with up to approximately 10,000 population need to look only to leadership.
3. Our districts with more than 10,000 population must look to better legal mechanisms and to leadership.

The school district should be of sufficient size to:

1. Yield a goodly number of able citizens potentially responsive to the opportunities for providing leadership on educational and related matters.
2. Make it possible to represent the broad interests of the state and thus potentially, at least, to make the community a good representative "committee" of the entire state.
3. Make it possible to attract educational leadership and to pay for it without disproportionate burdens for administration.
4. Permit the organization of efficient school attendance units.

The policy of attempting to meet all educational needs through a single administrative unit based on general criteria has an obvious deficiency. It does not take into account the many and varied requirements needed to provide different kinds of educational services. From the standpoint of efficiency and economy, there are a number of these specialized services which many school districts find difficult to provide, including trade and industrial education, post high school education, adequate library facilities, audiovisual aids, action research, guidance and counseling programs, pupil health services, and special education services. These services not only require large pupil population bases, but different kinds of administrative and supervisory arrangements as well.

Providing Special Education Services. Because the proportion of exceptional children in a given population is low, it is difficult for school districts with small pupil population bases to provide special education services. The school reorganization movement, therefore, has undoubtedly had a positive effect on the growth of special education. By reducing the number of small districts and creating larger pupil population bases, sufficient numbers of exceptional children can justify special education services in many public schools.

Although district reorganization has occurred, many of the existing school districts still lack sufficient numbers of exceptional children to justify special education facilities on the basis of efficiency and economy. A school district may be far beyond the minimal standards for efficiency and economy for most school purposes and, at the same time, have too few exceptional children to justify special education programs. This is particularly true in the rural areas.

In many instances, large districts with special classes have admitted children from other school districts on an individual basis, but this has met the needs of comparatively few children from small districts. In order to meet the needs of more children, cooperative programs have been organized whereby the largest district is responsible for establishing, maintaining, and financing the program during the school year and then billing the participating districts on a tuition basis.

This kind of arrangement creates a number of problems. The smaller participating districts often have no voice in the administrative or educational planning and are completely dependent upon the sponsoring district from year to year. Children from the districts operating special classes are often given priority over children from other districts. If the classes are filled to capacity, a child from another district may be denied the service. On the other hand, the unexpected withdrawal of participating districts tends to undermine programs by leaving teachers with tenure and too few pupils for a class. These kinds of problems often contribute to temporary, discontinuous, administrative arrangements which do not always contribute to the educational needs of children.

A number of states have tried to resolve these problems with cooperative special education programs which permit two or more school districts to share responsibility, administration, resources, cost, and staff to provide for the needs of their children. There are several advantages to the cooperative program: (a) a legal contract provides both continuity and stability for the program; (b) administrative and financial arrangements are defined; (c) sufficient numbers of children can be obtained to justify special classes or services for the various areas of exceptionality; (d) per capita cost for special services is reduced; (e) space and facilities available in the various districts may be shared, thus providing more adequate classrooms and services; and (f) a competent professional staff trained in the education of exceptional children can be employed.

It is only natural that any innovation in a school district involving relinquishment of responsibility and changes in working relationships will be the object of questions and concern for citizens, parents, members of boards of education, and the professional staff of the schools. With intelligent planning, however, mutually satisfactory solutions can usually be found for problems of an administrative nature.

Unfortunately, while some school districts exercised their discretion in establishing special education programs, others did not. The reasons why school districts, either individually or cooperatively, did or did not establish special education programs under permissive law are not clear. Several explanations have been advanced, including such variables as the number of exceptional children needing services, socioeconomic variables, and local attitude. At the present time, however, there is little objective evidence supporting these opinions. This study addresses itself to the task of identifying the factors which are related to the provision of special education services in the public school.

2

Method

In the absence of an operational model for studying the relationships between the provision of special education services and the demographic and economic characteristics, it was necessary to develop a procedure of investigation which would help explain why special education services are provided in some regions but not in others. This required the selection of:

1. A representative sample of special education services to be studied.
2. A comparative statistic measuring the extent to which these services were provided by the units under investigation.
3. The pertinent variables describing the demographic and economic characteristics of the units under study.
4. A statistical method of analysis which would reduce the pertinent variables to a smaller number of psychologically meaningful factor variables.

Four special education services were selected for study, including those for the deaf, the speech handicapped, the educable mentally handicapped, and those of a director of special education. The proportion of the total pupil population receiving each special education service was determined for each of 101 Illinois counties and studied in relation to demographic and economic characteristics presumed to be related to these services. Data were obtained from the Office of the Superintendent of Public Instruction, State of Illinois; the Illinois Department of Public Health; and the US Bureau of the Census, Washington, D. C.

A principal axis factor analysis with varimax rotation was used to reduce the 31 economic and demographic characteristics to a smaller number of underlying factors. Multiple regression analysis was used to determine the relative strength of the economic and demographic variables in predicting the proportion of children per county receiving special education services. Two different data analyses were conducted. The first included all 102 Illinois counties. However, Cook County was excluded from the second analysis, because it was so large that no other county approached it statistically. The elimination of Cook County, therefore, allowed a better identification of the differences among the remaining 101 counties.

County as Unit of Study

Any operational model should be constructed so it can have as wide a range of potential application as possible. In order to meet this criterion, the county was selected as the basic unit for study and comparison. This selection offers several advantages, the major one being that a variety of geographic, economic, demographic, and educational data is available for each county. These data are compiled systematically at regular intervals by county, state, and federal agencies and may be obtained upon request. Although school data are collected by districts which in many cases overlap county boundaries, the proportion of overlap for a given county is relatively small when compared to the proportion of the school districts entirely within the boundaries of a county. Regardless of county residence, a child is counted only in that county where the school district office is located; thus, no child is counted more than once.

As a political and administrative subdivision, the county is found in all states with the exception of Louisiana, where the corresponding unit is called the parish. The county, therefore, provides a common and discrete unit for comparative purposes within and between states. It is also a more stable unit than the school district and can be utilized in making comparisons of trends over a number of years.

Although the school district in Illinois serves as the basic administrative organization for providing common public education, a number of problems are to be found in its use as the unit of observation. First, the school district does not provide a common unit for a comparative study. The Illinois School Problems Commission Number 7 (1963) reported nine different kinds of school districts in the state. In addition, the fact that the geographic boundaries of one school district may overlap those of another precludes the use of the school district as an administrative unit with mutually exclusive boundaries. The situation is further complicated because there are school districts which have no teachers, rooms, or buildings, and which contract their pupils to other districts on a tuition basis. These complex and overlapping arrangements not only fail to provide common units for observation and comparison, but they also result in complex accounting and record keeping.

Second, the school district is undergoing a process of transition and change brought about by the school reorganization movement. Smaller districts are continually being reorganized into larger ones. Sumption and Beem (1947) reported that in 1945 Illinois had 11,955 school districts. By 1963 that number had been reduced to 1,511. There is, then, a marked lack of stability among the smaller districts. Thus, their number would vary for investigations designed to make comparisons over a number of years.

Third, the kinds of data that are gathered regarding school districts are limited. The Bureau of Census gathers data for regions, divisions, states, counties, and metropolitan statistical areas. To acquire these kinds of information, each district would have to be surveyed individually. In view of the large number of school districts that would be involved in such an undertaking, the elements of time, staff size, and expense would be prohibitive and beyond the scope of this study.

Fourth, an intrastate and certainly an interstate study would yield large numbers of school districts which would prove statistically cumbersome. Furthermore, future interstate studies would be difficult to conduct in states where districts do not exist, or where counties or parishes are used as the basic administrative unit for public education.

In view of the inadequacies of the school district as a unit for study, the county remains the only logical geographical and legal administrative unit available.

Criteria

The criterion measure selected for each area of exceptionality consisted of the proportion of the total pupil population base receiving the special education service. The general formula for determining the criteria measures is presented below.

$$\text{Proportion of county pupil population base receiving the special service} \rightarrow \frac{\text{Number of children receiving the special service}}{\text{County pupil population base}}$$

Whether or not a child was counted as receiving a special education service was dependent upon whether that service met the minimum standards set forth by the Office of the Superintendent of Public Instruction, State of Illinois. A criterion of this kind was necessary to insure trained personnel, minimal physical plant facilities, small numbers of children per class, an appropriate age range, and the placement of the child in a class appropriate to his educational need. Since four different kinds of special education services were studied, it is necessary to present the specific formula used for each.

Deaf Criterion.

$$\begin{array}{l}\text{Proportion of county popu-}\\ \text{lation base served in public}\\ \text{school classes for deaf}\end{array} \rightarrow \frac{\begin{array}{l}\text{Number of deaf children per county in}\\ \text{ADA in public school classes for deaf}\end{array}}{\left(\begin{array}{l}\text{Public school}\\ \text{ADA per county,}\\ \text{grades 1-12}\end{array}\right) + \left(\begin{array}{l}\text{Preschool}\\ \text{estimate}\\ \text{age 3-5}\end{array}\right)}$$

Because of the necessity for early instruction for deaf children, it was necessary to estimate the number of preschool children in the three to five year age range. The following method of estimate was devised to determine the number of these children residing in Illinois counties during the 1962-1963 school year.

1. The number of live births and infant deaths per county was obtained for the years 1957, 1958, and 1959 from the Illinois Department of Public Health.
2. By subtracting the number of infant deaths from the number of live births, an estimated number of preschool children aged three, four, and five years was obtained for each county for the 1962-1963 school year.

Two variables were not controlled by this method of estimate: (a) the mortality rate after the first year of life and (b) the effects of migration for the years 1957, 1958, and 1959. William H. Peckham, principal statistician for the Illinois department of health, stated in a personal communication, "The mortality of children over one year but less than five years is insignificant for your purposes." In order to estimate the maximum effect of casual migration on the deaf population of three, four, and five year old children during the 1962-1963 school year, the following procedure was devised:

1. A comparison of net gain or loss through civilian migration in Illinois counties from 1950 to 1960 revealed DuPage County as having the greatest change. The population of DuPage County increased by 121,512 persons during the 10 year period.
2. The Bureau of Census reported that, in 1960, 12.8 percent of the population in DuPage County was under 5 years of age. The age classification was based on the age of the person in years as of April 1, 1960.

3. The number of persons (121,512) who migrated into DuPage County during the period 1950-1960 was multiplied by 12.8 percent, which was the proportion of children in DuPage County under 5 years of age. The product gives approximately 15,333 children aged 5 years or younger who migrated into DuPage County during a 10 year period.
4. Since approximately three-fifths of the 15,553 children were aged 3, 4, or 5, it was estimated that 9,331.8 children of these ages had migrated into DuPage County during a 10 year period.
5. It would seem reasonable to assume that the rate of migration into DuPage County over a 10 year period was relatively constant. If so, this rate would yield an average annual increase of 933.2 children aged 3 to 5. Therefore, the effect of migration during 1957, 1958, and 1959 would be to increase the county preschool population base by 2,799.6 of these children for the 1962-1963 school year.
6. The multiplying of 2,799.6 by the prevalence rate of .1 percent yields the 2.799 deaf children brought into the county through casual, civilian migration.

The addition of three deaf children to a county would not be sufficient justification in and of itself to organize a public school class. It is possible, however, that three additional deaf children might increase the total number of deaf children and thus stimulate the organization of a single class for the deaf, provided that the age range of the children is not too great. On the other hand, if deaf classes already exist in the county, the addition of three children could probably be met by the existing program.

It is recognized that public school programs for the deaf result in deliberate migration by families with deaf children; but a minimum number of deaf children is probably necessary to organize a class and put it into operation before deliberate migration occurs. It is difficult to determine the extent to which deliberate civilian migration to communities offering service for the deaf occurs, unless the family history of each deaf child is studied.

Speech Correction Criterion.

$$\begin{array}{l}\text{Proportion of total pupil}\\ \text{population base receiving}\\ \text{speech correction services}\end{array} \rightarrow \frac{\begin{array}{l}\text{Case load per county of children}\\ \text{receiving speech correction services}\end{array}}{\text{Total county ADA, grades 1-12}}$$

The total weekly case load was chosen as the measure of the extent to which speech correction services are offered per county. In Illinois the case load per speech correctionist is between 70 and 100 pupils a week and is supposed to remain within that range throughout the school year. When one child is dismissed, he is replaced by a child from a waiting list. The advantage of using the case load is that it can be used as a comparative measure at any given time during the school year, and it is not contaminated by differences in pupil selection, grouping, duration of speech correction service, and dismissal procedures.

Educable Mentally Handicapped Criteria.

1. Proportion of county pupil population base in elementary classes for educable mentally handicapped →

$$\frac{\text{Number of children in elementary classes for educable mentally handicapped}}{\text{County ADA, grades 1-12}}$$

2. Proportion of county pupil population base in secondary classes for educable mentally handicapped →

$$\frac{\text{Number of children in secondary classes for educable mentally handicapped}}{\text{County ADA, grades 1-12}}$$

Secondary classes were defined as those classes for educable mentally handicapped children that were conducted as part of three or four year high school programs. All other special classes for educable mentally handicapped were categorized as elementary classes.

Director of Special Education Criterion.

Proportion of county pupil population base served by director of special education →

$$\frac{\text{Number of children in ADA per county under supervision of director}}{\text{County ADA, grades 1-12}}$$

In addition to coordinating the special education program, the director is responsible for providing leadership in establishing screening, identification, and placement procedures, and services to meet the special educational needs of the pupil population.

Variables Presumed to Be Related to Special Education Provisions

In order to compare the characteristics of counties that did provide services with those that did not, it was necessary to select those variables presumed to be related to special education provisions. A survey was made of the demographic and economic data which are systematically compiled by county, state, or federal agencies. Those variables which seemingly described the demographic and economic characteristics of Illinois counties were selected for study and are presented in Figure 1.

FIGURE 1. Variables Presumed to Be Related to Special Education Provisions.

1. Total Equalized Assessed Valuation
2. Equalized Assessed Valuation per Child in Average Daily Attendance
3. Median Income in 1959 of Families, 1960
4. Proportion of Families with Income below $3,000
5. Proportion of Families with Income $10,000 or above
6. Total Population, 1960
7. Population per Square Mile
8. Net Gain or Loss through Civilian Migration 1950-1960
9. Families in Urban Residence, Percent
10. Families in Rural Farm Residence, Percent
11. Nonwhite Population
12. Median School Years Completed
13. Completed Fewer than Five Years of School, Percent
14. Completed High School or More, Percent
15. Public School Average Daily Attendance K-12, 1963
16. Private School Enrollments, Grades 1-12, 1963
17. Percent Increase in Average Daily Attendance 1951-1961
18. Pupil Density per Square Mile, Grades 1-12
19. Ratio of Largest School District to Total County Average Daily Attendance
20. Average Daily Attendance of Largest District
21. Proportion of Civilian Labor Force Engaged in Agriculture
22. Proportion of Civilian Labor Force Engaged in Construction
23. Proportion of Civilian Labor Force Engaged in Transportation, Communication, and Other Public Utilities
24. Proportion of Civilian Labor Force Engaged in Wholesale and Retail Trade
25. Proportion of Civilian Labor Force Engaged in White Collar Occupations
26. Proportion of Civilian Labor Force Working outside County of Residence
27. Proportion of Civilian Labor Force Engaged in Public Administration
28. Proportion of Civilian Labor Force Engaged in Educational Services
29. Proportion of Civilian Labor Force Engaged in Finance, Insurance, and Real Estate
30. Proportion of Civilian Labor Force Engaged in Manufacturing
31. Total Civilian Labor Force, Percent Unemployed

Data Sources

The data used in the study were obtained from three sources:

1. All data regarding school attendance or equalized assessed valuation were obtained from the Division of Special Education and Auditing Division of the Office of the Superintendent of Public Instruction in Springfield, Illinois.
2. Data concerning area size, population, income, education, migration, and labor force were obtained from the United States Bureau of the Census in Washington, D.C. In some instances it was necessary to divide or add two statistics to determine a third statistic.
3. The Department of Public Health in Springfield, Illinois, provided data and information which were used in estimating the number of preschool children per county.

Basis for Selection

Four special education services were selected for study, including the deaf, the speech handicapped, the educable mentally handicapped, and services of a director of special education. Each of these areas was selected for a specific purpose.

1. Services for the deaf represented a program in which the prevalence was extremely low. A small number of children requiring a needed service presents many adminstrative problems. Although there is a shortage of teachers in many areas of the education profession, this problem is particularly acute in the area of the deaf. Bringing together sufficient numbers of children for a single class presents transportation and cost problems. When one thinks not in terms of one class, but of a kindergarten through high school or post high school program, the population base required to provide sufficient numbers of pupils becomes extremely large. Findings relating to provisions for deaf children may suggest implications for other low prevalence areas, such as the area of the blind.
2. Speech correction provided an example of an itinerant teacher service. The speech correctionist often travels from one school to another to work with children needing speech correction. Other itinerant personnel, such as psychologists, public school nurses, remedial reading teachers, guidance and counseling personnel, and social workers, also travel from school to school. Implications for these positions may be similar to the findings obtained for the area of speech correction.

3. There are several reasons why the area of the educable mentally handicapped was selected for study. Classes for the educable mentally handicapped are often the backbone of special education programs, because the prevalence of educable mentally handicapped children is higher than the prevalence of many other exceptionalities. This service also represents a classroom program.

   Since there were 34 counties with elementary programs for educable mentally handicapped children and only 10 counties with secondary programs for these children, the decision was made to treat the data for elementary and secondary programs independently. This was done to try to determine whether the factors that related to the presence or absence of elementary and secondary programs were the same or different.
4. The services of a director of special education were selected because they provided an example of an administrative or supervisory service. The presence of a director working full time in administering special education services and providing leadership and direction should have implications for the development of special education programs within Illinois counties.

Specific definitions of these services were obtained from the *Rules and Regulations To Govern the Administration and Operation of Special Education* (Page, 1964) for the State of Illinois:

Deaf: A deaf child is defined as that child in whom the residual hearing is not sufficient to enable him to understand speech and develop language successfully, even with a hearing aid, without specialized instruction. Two interpretations of a deaf child are noted:

(a) An audiological interpretation of a deaf child is generally understood to be a child with a hearing loss approaching an average of 75 to 80 decibels or greater across the speech range in the better ear, without a hearing aid.

(b) An educational interpretation of a deaf child is generally understood to include a child with a hearing loss approaching an average of 60 or 65 decibels across the speech range in the better ear without a hearing aid, and who is unable to develop language successfully, even with a hearing aid, without special education (p. 18).

Speech Correction: Speech defective children . . . means children between the ages of 3 and 21 whose diagnosis by . . . a qualified speech correctionist indicates that specialized instruction would improve or correct the defects (p. 51).

Educable Mentally Handicapped: Educable mentally handicapped children . . . means children between the ages of 5 and 21 years of age who, because of retarded intellectual development as determined by individual psychological examination, are incapable of being educated profitably and efficiently through ordinary classroom instruction but who may be expected to benefit from special education facilities designed to make them economically useful and socially adjusted (p. 42).

Services of a Director: The position of administrator of special education shall be a specialized staff position comparable to other administrators in a school system. This administrator shall be qualified to give direction to, and be responsible for, the administration, supervision, and coordination of the overall educational program for exceptional children. Therefore, he must have an understanding of and be knowledgeable in all areas of special education. Reimbursement shall be given only for an administrator who gives full time to special education.

No administrator of special education shall be approved for reimbursement as a full time administrator of special education unless there are ten or more professional workers in three or more areas of special education under his direction who have been approved as such by the Division of Special Education. In the case of new programs being developed in a school district or school districts under his direction, a probationary period not to exceed two years shall be permitted to complete the organization and development of such a program of special education resulting in the employment of ten approved special education workers (p. 71).

Statistical Treatment

Multiple regression and factor analytic techniques were used to study the relationship between the presence or absence of special education services in Illinois counties and the economic and demographic characteristics of counties. These techniques, which were developed for the IBM 7094 computer, permitted the processing and analyzing of a large amount of information.

Factor Analysis. A principal axis factor analysis with varimax rotation was used to reduce the 31 independent variables to a smaller number of underlying dimensions or sources of common variance. The reduction of the number of sources of common variance would result in greater economy and ease of interpretation of results. Accordingly, data from 101 counties were submitted to a principal axis factor analysis. The raw data matrix consisted of raw scores of 31 demographic and economic variables for each county.

One of the problems faced in executing factor analysis is determining when to stop factoring. Fortunately, there are criteria available which can help the researcher determine when to stop. Dickman (1960) describes a method for eliminating *k* (the number of common factors) when unities (+ 1.00) are inserted in the diagnosis of the correlation matrix. Very briefly, the criterion is that the number of factors in the matrix can be estimated as equal to the number of principal axis factors with latent roots equal to or greater than + 1.00. The factor analytic program written for the digital computer was written in such a way that the computer stopped extracting principal axis factors when the value of the latent root dropped below + 1.00.

Once the principal axis factors had been extracted from the correlation matrix, the next step was to rotate the factors to orthogonal simple structure. The varimax method was used to approximate orthogonal simple structure in rotation (Kaiser, 1958). The decision to rotate orthogonal independent factors was dictated by the need for orthogonal factors in order to generate factor scores.

Multiple Regression Analysis. Multiple regression analysis was used to determine the relative strength of the economic and demographic variables in predicting the proportion of children per county receiving special education services in each area studied. Through the use of the 31 variables as predictors, a measure of maximum predictability was obtained. Multiple regression analysis was also used to determine the strength of the six factors as predictors. It was expected that the multiple correlation coefficients derived from the six factors would lack the predictive power attained by all 31 variables. Reduced predictive power was anticipated because of prediction with fewer variables. Furthermore, even though a given variable may be heavily loaded on its factor, the variable may or may not be correlated with the criteria variable.

Development of Special Education Expectancy Index

To facilitate the study of the relationships between the six factors and the presence or absence of special education services in Illinois, a special education index was developed. The index was used to provide a comparative measure of the likelihood or expectancy that counties would provide special education services. It was also used to compare expectancy to provide services among counties of approximately the same potential ability. The factor scores for each county can be used to help explain why various counties did or did not provide specialized services. An index was developed for each specialized service studied.

The procedure for developing the expectancy index is outlined as follows:

1. Six factors were generated from a factor analysis conducted on 31 economic and demographic variables for 101 Illinois counties.
2. Factor scores (Kaiser, 1962) were obtained for each county.

$$\text{Factor scores} \rightarrow (z)\ (R_{pp}^{-1})\ (V')$$

where:

z = standard scores for the raw data of 31 variables,

R_{pp}^{-1} = the inverse of the intercorrelation matrix of the predictors with the predictors,

and

V' = the varimax factor matrix transposed.

3. Beta weights were obtained for the six factors on the five criteria variables through multiple regression analyses of the six factors and each of the five criteria variables.
4. A comparative index score measuring the expectancy or likelihood of a county to provide a given special education service was developed for each specialized service studied. This was done by weighting the six factor scores for a county with the beta weights obtained for that particular service and summing the cross products. For example:

$$\text{Index score for Adams County on deaf services} = \beta f_1 + \beta f_2 + \beta f_3 + \beta f_4 + \beta f_5 + \beta f_6$$

where β_k = the beta weight for the deaf services

and f_k = the factor score for Adams County on the K^{th} factor.

After an index number of the comparative expectancy of counties to support specialized services was obtained, the counties were placed on a frequency distribution. Counties at the top of the distribution would be expected to have the special education service; these were called high expectancy counties. Counties at the bottom of the distribution were not expected to provide services; these were called low expectancy counties.

The distribution was inspected to determine the point which seemed to differentiate the majority of counties with services from the majority of those without services. The point was specifically established by minimizing the differences between the number of high expectancy counties without services and the number of low expectancy counties with services.

A measure of effectiveness was obtained by the following ratio:

$$\text{Effectiveness} = \frac{\text{number of high expectancy counties providing services}}{\text{total number of high and low expectancy counties providing services.}}$$

For example, if there are 11 counties that provide public school programs for deaf children and the index identifies 9 counties as high expectancy, the index is approximately 82 percent effective.

A measure of efficiency was obtained as follows:

$$\text{Efficiency} = \frac{\text{number of high expectancy counties providing services}}{\text{total number of high expectancy counties predicted to have services.}}$$

For example, if the index identifies 12 counties as being expected to provide deaf services and only 9 counties actually do provide services, the index is approximately 75 percent efficient.

3

Results

The master intercorrelation matrix used for both the factor and regression analysis is presented in Table 1. The first 31 variables in the table were selected as probable indicators of whether or not counties could be expected to provide special education services. The remaining five variables were the criteria measures which consisted of the proportion of a county's school population base receiving the special education services selected for study.

Key to Master Intercorrelation Matrix (Table 1)

1. Total Equalized Assessed Valuation
2. Equalized Assessed Valuation per Child in Average Daily Attendance
3. Median Income in 1959 of Families, 1960
4. Proportion of Families with Income below $3,000
5. Proportion of Families with Income $10,000 or above
6. Total Population, 1960
7. Population per Square Mile
8. Net Gain or Loss through Civilian Migration 1950-1960
9. Families in Urban Residence, Percent
10. Families in Rural Farm Residence, Percent
11. Nonwhite Population
12. Median School Years Completed
13. Completed Fewer than Five Years of School, Percent
14. Completed High School or More, Percent
15. Public School Average Daily Attendance K-12, 1963
16. Private School Enrollments, Grades 1-12, 1963
17. Percent Increase in Average Daily Attendance 1951-1961
18. Pupil Density per Square Mile, Grades 1-12
19. Ratio of Largest School District to Total County Average Daily Attendance
20. Average Daily Attendance of Largest District
21. Proportion of Civilian Labor Force Engaged in Agriculture
22. Proportion of Civilian Labor Force Engaged in Construction
23. Proportion of Civilian Labor Force Engaged in Transportation, Communication, and Other Public Utilities
24. Proportion of Civilian Labor Force Engaged in Wholesale and Retail Trade
25. Proportion of Civilian Labor Force Engaged in White Collar Occupations

TABLE 1
Master Intercorrelation Matrix of 31 Indicator and 5 Criteria Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
1	1.00																																			
2	.21	1.00																																		
3	.77	.27	1.00																																	
4	-.63	-.29	-.96	1.00																																
5	.88	.19	.93	-.83	1.00																															
6	.93	.03	.76	-.65	.83	1.00																														
7	.93	.02	.71	-.56	.84	.92	1.00																													
8	.85	.12	.63	-.46	.79	.73	.88	1.00																												
9	.60	-.09	.69	-.66	.66	.71	.61	.38	1.00																											
10	-.61	.08	-.67	.60	-.64	-.71	-.62	-.39	-.81	1.00																										
11	.11	-.21	-.08	.13	.00	.21	.17	.04	.18	-.36	1.00																									
12	.50	.27	.70	-.68	.69	.47	.43	.44	.41	-.33	-.13	1.00																								
13	-.21	-.11	-.48	.50	-.36	-.17	-.14	-.19	-.16	-.10	.53	-.63	1.00																							
14	.49	.24	.71	-.71	.68	.44	.42	.44	.43	-.34	-.15	.95	-.66	1.00																						
15	.94	.03	.77	-.65	.84	.99	.95	.78	.69	-.69	.18	.47	-.19	.46	1.00																					
16	.92	.07	.73	-.61	.81	.95	.90	.76	.62	-.64	.20	.42	-.16	.38	.94	1.00																				
17	.78	.21	.90	-.83	.90	.76	.73	.74	.56	-.52	-.03	.68	-.46	.68	.77	.75	1.00																			
18	.89	.05	.69	-.53	.81	.86	.96	.87	.54	-.56	.13	.45	-.18	.44	.90	.84	.72	1.00																		
19	-.25	-.47	-.23	.20	-.19	-.15	-.16	-.16	-.00	.14	.06	-.15	.02	-.12	-.18	-.14	-.20	-.20	1.00																	
20	.55	-.16	.58	-.55	.54	.78	.61	.32	.69	-.65	.26	.36	-.15	.33	.74	.68	.52	.54	.18	1.00																
21	-.59	.13	-.63	.57	-.62	-.69	-.61	-.37	-.80	.95	-.31	-.24	-.07	-.24	-.67	-.62	-.48	-.55	.11	-.65	1.00															
22	.04	-.05	-.03	.07	.07	-.06	.01	.11	-.09	.04	-.09	-.12	.11	-.14	-.03	.03	.00	-.02	.11	-.12	.03	1.00														
23	.07	-.11	-.02	.06	-.03	.10	.12	.08	.21	-.30	.39	-.12	.22	-.11	.09	.09	-.04	.18	.02	.09	-.30	-.02	1.00													
24	-.01	-.21	-.08	.07	-.01	.01	.01	-.08	.23	-.25	.29	-.01	.07	.05	.00	-.02	-.08	-.01	.04	.09	-.22	-.00	.31	1.00												
25	.63	-.08	.65	-.59	.73	.69	.65	.50	.75	-.77	.23	.57	-.16	.58	.68	.63	.59	.63	-.05	.61	-.75	-.09	.26	.34	1.00											
26	.21	.18	.17	-.11	.21	.07	.24	.43	-.24	.13	-.02	.01	.00	.00	.12	.15	.26	.25	-.14	-.23	.15	.20	-.02	-.31	-.13	1.00										
27	-.02	-.11	-.15	.14	-.07	.03	-.02	-.04	-.10	.05	.20	-.09	.15	-.12	-.01	.07	-.13	.03	.08	.08	.07	.03	.15	.09	.13	.04	1.00									
28	-.06	-.02	-.03	.02	.02	-.03	-.06	-.00	.06	-.08	.08	.25	-.02	.29	-.05	-.10	.01	-.03	.02	-.04	-.05	-.02	.02	.06	.30	-.11	.08	1.00								
29	.48	-.02	.56	-.54	.58	.52	.48	.36	.56	-.51	.06	.45	-.28	.46	.51	.48	.48	.46	-.07	.48	-.50	-.14	.13	.16	.71	-.07	.08	.05	1.00							
30	.53	.08	.73	-.71	.61	.58	.50	.36	.54	-.53	.01	.36	-.27	.34	.59	.54	.65	.44	-.16	.50	-.55	-.15	-.15	-.25	.26	.14	-.37	-.30	.22	1.00						
31	-.25	-.27	-.51	.54	-.45	-.19	-.17	-.27	-.07	-.11	.37	-.57	.60	-.58	-.20	-.21	-.56	-.20	.11	-.11	-.15	.02	.37	.27	-.07	-.08	.20	-.01	-.24	-.31	1.00					
32	.34	-.03	.32	-.30	.35	.41	.36	.26	.40	-.37	.07	.32	-.18	.33	.38	.34	.34	.34	.12	.49	-.35	-.00	-.04	.07	.49	-.14	.14	.19	.27	.20	-.13	1.00				
33	.33	-.10	.38	-.35	.41	.39	.37	.28	.50	-.43	.07	.21	-.09	.25	.38	.34	.35	.33	.10	.36	-.41	-.03	.13	.16	.44	-.17	-.11	.04	.42	.23	-.06	.28	1.00			
34	.23	-.15	.37	-.40	.33	.38	.24	.07	.64	-.58	.19	.24	-.02	.28	.33	.28	.30	.18	.15	.48	-.58	-.00	.07	.26	.56	-.27	-.01	.31	.32	.26	.00	.53	.49	1.00		
35	.10	-.06	.10	-.08	.15	.11	.11	.07	.20	-.16	-.00	.14	-.05	.17	.10	.04	.10	.10	.02	.09	-.13	.00	-.07	.07	.26	-.08	-.03	.33	.17	-.08	.05	.21	.29	.35	1.00	
36	.49	-.10	.45	-.41	.47	.57	.53	.42	.44	-.41	.11	.33	-.20	.34	.57	.46	.46	.49	.06	.51	-.41	-.12	.12	-.07	.46	-.02	-.09	.12	.44	.34	-.19	.22	.54	.39	.40	1.00

Note.—The key to Table 1 appears on pages 20 and 22.

26. Proportion of Civilian Labor Force Working outside County of Residence
27. Proportion of Civilian Labor Force Engaged in Public Administration
28. Proportion of Civilian Labor Force Engaged in Educational Services
29. Proportion of Civilian Labor Force Engaged in Finance, Insurance, and Real Estate
30. Proportion of Civilian Labor Force Engaged in Manufacturing
31. Total Civilian Labor Force, Percent Unemployed
32. Proportion of County Pupil Population Base Receiving Services in Classes for Deaf
33. Proportion of County Pupil Population Base Receiving Speech Correction Services
34. Proportion of County Pupil Population Base in Elementary Classes for Educable Mentally Handicapped
35. Proportion of County Pupil Population Base in Secondary Classes for Educable Mentally Handicapped
36. Proportion of County Pupil Population Base under Supervision of Director of Special Education

Principal Axis Factors

In order to reduce the 31 indicator variables to a smaller number of meaningful factor variables, the intercorrelations of the 31 indicator variables were calculated, and principal axis factors were extracted by means of a program written for the IBM 7094 computer. The number of common matrix factors generated from the analysis was determined by setting the number of factors equal to the number of roots which were greater than or equal to + 1.00.

The loadings between the six factors and the 31 indicator variables are presented in Table 2. The comparative strength of each factor can be determined by comparing the weight of the factor loadings and the accounted for variances of the factors. Since a factor loading of ± .30 or more is traditionally used as the criterion for including variables in the identification and description of factors, this criterion was applied in this comparison.

TABLE 2
Factor Loadings Rotated Orthogonally by Varimax Method for 31 Indicator Variables: N = 101

Variables	*Factors*					
	I	*II*	*III*	*IV*	*V*	*VI*
1. Equalized Assessed Valuation per County	94	07	—01	—01	17	08
2. Valuation per Child in Average Daily Attendance	02	23	—05	—05	78	—00
3. Median Family Income	79	39	10	—34	18	—04
4. Family Income $3,000 or Less	—66	—46	—12	40	—17	12
5. Family Income $10,000 or More	88	32	14	—16	13	10
6. Total Population	97	01	00	—05	—02	—09

TABLE 2—continued

Variables	*Factors* I	*II*	*III*	*IV*	*V*	*VI*
7. Population per Square Mile	96	—01	—03	05	04	09
8. Civilian Migration	83	12	—04	17	16	34
9. Urban Residence, Percent	68	—02	31	—44	—16	—24
10. Rural Farm Residence, Percent	—71	27	—34	45	02	16
11. Nonwhite Population, Percent	23	—63	18	10	—05	—16
12. Median School Years Completed	47	66	38	—03	18	—11
13. Completed Fewer than 5 Years of School	—16	—83	—07	02	04	10
14. Completed High School or More	45	68	43	—05	16	—10
15. Public School Average Daily Attendance K-12	97	02	—02	—04	01	—05
16. Private School Enrollments, Grades 1-12	95	00	—07	01	00	—01
17. Change in Public School Average Daily Attendance 1951-1961, Percent	80	42	05	—16	15	08
18. School Age Children per Square Mile	92	02	00	13	10	09
19. Ratio of Largest School District to Total County Average Daily Attendance	—13	05	00	09	—83	07
20. Average Daily Attendance of Largest District in County	71	01	05	—15	—37	—37
21. Employed in Agriculture, Percent	—69	29	—29	48	08	15
22. Employed in Construction, Percent	—01	—05	07	—13	—20	83
23. Employed in Transportation, Communication, and Public Utilities, Percent	15	—52	36	05	05	—01
24. Employed in Wholesale and Retail Trade, Percent	—00	—28	60	—04	—14	—10
25. Employed White Collar Occupations, Percent	72	02	60	—07	—07	—15
26. Employed Outside of County, Percent	21	04	—32	23	32	54
27. Employed in Public Administration, Percent	07	—19	15	67	—12	—13
28. Employed in Education, Percent	—07	12	66	17	05	09
29. Employed in Finance, Insurance, and Real Estate, Percent	56	18	36	—02	—06	—26
30. Employed in Manufacturing, Percent	58	20	—36	—58	06	—17
31. Unemployed, Percent	—20	—81	09	04	—12	—01
Percent Variance Accounted for:						
Principal Axis	44	13	8	6	5	4
Varimax	51	17	10	8	8	7

Note: Decimal points omitted.

In Factor I, 20 variables had factor loadings of ± .30 or more. Factor I accounted for 44 percent of the variance on the principal axis rotations. The second strongest factor was number II, which had only 10 variables with factor loadings equal to or greater than ± .30. Factor II accounted for 13 percent of the principal axis variance. Although Factor III had 11 variables with factor loadings of ± .30, only 8 percent of the variance was accounted for by this factor. Factor IV had 7 variables with factor loadings of at least ± .30, which accounted for 6 percent of the variance. Factors V and VI each had 4 variables with loadings of at least ± .30. Factor V accounted for 5 percent of the variance, and Factor VI accounted for 4 percent. The percent of the accounted for variance for both the principal axis and the varimax rotations is presented at the bottom of Table 2.

In order to identify and interpret the six factors, the variables comprising each factor were listed in descending order of their factor loadings. In order to identify the underlying element of each factor, the relationships between the variables were considered. Primary consideration was given to the variables with the heaviest loadings.

Factor I. This factor (Table 3) was designated as the urban factor, because the variables with high positive loadings are often character-

TABLE 3
Factor I—Urban

Indicator Variables	*Factor Loadings*
Public School Average Daily Attendance K-12	97
Total Population	97
Population per Square Mile	96
Private School Enrollments, Grades 1-12	95
Equalized Assessed Valuation per County	94
School Age Children per Square Mile	92
Family Income $10,000 or More	88
Civilian Migration	83
Change in Public School Average Daily Attendance 1951-1961, Percent	80
Median Family Income	79
Employed in White Collar Occupations, Percent	72
Average Daily Attendance of Largest District in County	71
Urban Residence, Percent	68
Employed in Manufacturing, Percent	58
Employed in Finance, Insurance, and Real Estate, Percent	56
Median School Years Completed	47
Completed High School or More	45
Family Income $3,000 or Less	—66
Employed in Agriculture, Percent	—69
Rural Farm Residence, Percent	—71

Note: Accountable variance is 44 percent.

istic of urban areas. These include such variables as dense population, large numbers of children in school attendance, high family income, high educational level, large proportion of labor force in white collar or manufacturing occupations, and comparatively few people in agricultural work or rural farm residence. The urban county often possesses at least one school district with a large number of children in average daily attendance.

Factor II. Here the variables with significant loadings are those having to do with education or those indirectly related to educational attainment of the population (Table 4). High positive loadings were found for the proportion of residents per county completing high school or more, the median school years completed per county, and the change in average daily attendance per county between 1951 and 1961. Variables with negative loadings include a high proportion of the unemployed; the nonwhite population; persons completing fewer than five years of school; families making less than $3,000 per year; and persons employed in transportation services, communications, or public utilities.

TABLE 4
Factor II—Education

Indicator Variables	*Factor Loadings*
Completed High School or More	68
Median School Years Completed	66
Change in Public School Average Daily Attendance 1951-1961, Percent	42
Median Family Income	39
Family Income $10,000 or More	32
Family Income $3,000 or Less	—46
Employed in Transportation, Communication, and Public Utilities, Percent	—52
Nonwhite Population, Percent	—63
Unemployed, Percent	—81
Completed Fewer than 5 Years of School	—83

Note: Accountable variance is 13 percent.

Factor III. This factor includes variables describing the proportion of the population engaged in occupations which usually require formal education and are frequently associated with high socioeconomic levels (Table 5). Variables include education; white collar occupations; wholesale and retail trade; finance, insurance, and real estate; transportation, communication, and public utilities; and urban residence. Median school years per county were also positively loaded. Negative loadings were found for rural farm residence and manufacturing.

TABLE 5
Factor III—Socioeconomic Status

Indicator Variables	*Factor Loadings*
Employed in Education, Percent	66
Employed in White Collar Occupations, Percent	60
Employed in Wholesale and Retail Trade, Percent	60
Completed High School or More	43
Median School Years Completed	38
Employed in Finance, Insurance, and Real Estate, Percent	36
Employed in Transportation, Communication, and Public Utilities, Percent	36
Urban Residence	31
Employed outside of County, Percent	—32
Rural Farm Residence, Percent	—34
Employed in Manufacturing, Percent	—36

Note: Accountable variance is 8 percent.

Factor IV. This factor is characteristic of the income and occupations found in rural areas (Table 6). Positive loadings were found for the proportion of the labor force engaged in public administration, agricultural pursuits, and rural farm residence. This suggests that a large proportion of the labor force employed in public administration is found in rural counties. One explanation for this finding is that approximately the same kinds of public administrative posts are required for both urban and rural counties. Although the total number of persons employed in public administration is larger in urban than in rural counties, the number employed does not increase proportionately with the size of the population. Also associated with this factor are low median incomes and a small proportion of persons living in urban residence or engaged in manufacturing.

TABLE 6
Factor IV—Rural Occupations

Indicator Variables	*Factor Loadings*
Employed in Public Administration, Percent	67
Employed in Agriculture, Percent	48
Rural Farm Residence, Percent	45
Family Income $3,000 or Less	40
Median Family Income	—34
Urban Residence, Percent	—44
Employed in Manufacturing, Percent	—58

Note: Accountable variance is 6 percent.

Factor V. A measure of financial ability for the support of school programs, this factor suggests that large numbers of dollars in assessed valuation per child in average daily attendance are found in counties where (a) each school district has approximately the same number of children in average daily attendance or (b) none of the school districts have a large average daily attendance. These two situations might be representative either of wealthy urban counties where the school districts are approximately the same size or of sparsely populated rural counties where there are few children among whom to divide the assessed valuation.

TABLE 7
Factor V—Financial Ability

Indicator Variables	*Factor Loadings*
Valuation per Child in Average Daily Attendance	78
Employed outside County	32
Average Daily Attendance of Largest District in County	—37
Ratio of Largest School District to Total County Average Daily Attendance	—83

Note: Accountable variance is 5 percent.

Factor VI. This was identified as population growth (Table 8). Counties with growing populations require large numbers of people engaged in construction work for needed homes, apartments, schools, buildings, roads, bridges, and shopping centers. Rapidly growing counties near metropolitan areas often have large numbers of people commuting to factories, businesses, and offices in neighboring metropolitan counties. Positive civilian migration causes population growth and is reflected in increased school attendance.

TABLE 8
Factor VI—Population Growth

Indicator Variables	*Factor Loadings*
Employed in Construction, Percent	83
Employed outside of County, Percent	54
Civilian Migration	34
Average Daily Attendance of Largest District in County	—37

Note: Accountable variance is 4 percent.

Multiple Regression Analysis

The multiple regression coefficients that were obtained by using the 31 economic and demographic variables as predictors provided a maximum estimate of predictability. Table 9 presents the regression coefficients of the 5 criterion measures and the 31 indicator variables. The beta weights for the 31 variables on the criteria are shown in Table 10. With the possible exception of secondary programs for educable mentally handicapped children, high coefficients of correlation were obtained for the 31 indicator variables and the special services studied. Although the coefficients of correlation were high, they indicated only that relationships did exist between the variables and the special education services; they did not explain the dynamics of the relationships.

TABLE 9
Multiple Regression Coefficients for 31 Indicator Variables on Criteria

Kinds of Service	*Multiple Regression Coefficients*
Deaf	.74
Speech Correction	.66
Elementary Educable Mentally Handicapped	.81
Secondary Educable Mentally Handicapped	.54
Director Services	.73

TABLE 10
Beta Weights and Multiple Regression Coefficients for 31 Indicator Variables on Criteria

Indicator Variables	*Services for Deaf*	*Speech Correction Services*	*Elementary EMH Services*	*Secondary EMH Services*	*Services of a Director*
1. Total Equalized Assessed Valuation	.34	.33	.23	.10	.50
2. Equalized Assessed Valuation per Child in Average Daily Attendance	—.03	—.10	—.15	—.06	—.10
3. Median Income in 1959 of Families, 1960	.32	.38	.37	.10	.45
4. Proportion of Families with Income below $3,000	—.30	—.35	—.40	—.08	—.41
5. Proportion of Families with Income $10,000 and above	.35	.41	.33	.15	.47
6. Total Population, 1960	.41	.39	.38	.11	.57
7. Population per Square Mile	.36	.37	.24	.11	.53
8. Net Gain or Loss through Civilian Migration 1959-1960	.26	.28	.07	.07	.42
9. Families in Urban Residence, Percent	.40	.50	.64	.20	.44
10. Families in Rural Farm Residence, Percent	—.37	—.43	—.58	—.16	—.41
11. Nonwhite Population	.07	.07	.19	.00	.11

TABLE 10—continued

Indicator Variables	*Services for Deaf*	*Speech Correction Services*	*Elementary EMH Services*	*Secondary EMH Services*	*Services of a Director*
12. Median School Years Completed	.32	.21	.24	.14	.33
13. Completed Fewer than Five Years of School, Percent	—.18	—.09	—.02	—.05	—.20
14. Completed High School or More, Percent	.33	.25	.28	.17	.34
15. Public School Average Daily Attendance K-12, 1963	.38	.38	.33	.10	.57
16. Private School Enrollments, Grades 1-12, 1963	.34	.34	.28	.04	.46
17. Percent Increase in Average Daily Attendance 1951-1961	.34	.35	.30	.10	.46
18. Pupil Density per Square Mile, Grades 1-12	.34	.33	.18	.10	.49
19. Ratio of Largest School District to Total County Average Daily Attendance	.12	.10	.15	.02	.06
20. Average Daily Attendance of Largest District	.49	.36	.48	.09	.51
21. Proportion of Civilian Labor Force Engaged in Agriculture	—.35	—.41	—.58	—.13	—.41
22. Proportion of Civilian Labor Force Engaged in Construction	.00	—.03	.00	.00	—.12
23. Proportion of Civilian Labor Force Engaged in Transportation, Communication, and Other Public Utilities	—.04	.13	.07	—.07	.12
24. Proportion of Civilian Labor Force Engaged in Wholesale and Retail Trade	.07	.16	.26	.07	—.07
25. Proportion of Civilian Labor Force Engaged in White Collar Occupations	.49	.44	.56	.26	.46
26. Proportion of Civilian Labor Force Working outside County of Residence	—.14	—.17	—.27	—.08	—.02

TABLE 10—continued

Indicator Variables	*Services for Deaf*	*Speech Correction Services*	*Elementary EMH Services*	*Secondary EMH Services*	*Services of a Director*
27. Proportion of Civilian Labor Force Engaged in Public Administration	.14	—.11	—.01	—.03	—.09
28. Proportion of Civilian Labor Force Engaged in Educational Services	.19	.04	.31	.33	.12
29. Proportion of Civilian Labor Force Engaged in Finance, Insurance, and Real Estate	.27	.42	.32	.17	.44
30. Proportion of Civilian Labor Force Engaged in Manufacturing	.20	.23	.26	—.08	.34
31. Total Civilian Labor Force, Percent Unemployed	—.13	—.06	.00	.05	—.19
Multiple Regression Coefficients	.74	.66	.81	.54	.73

Multiple regression analysis was also used to determine the strength of the six factors as predictors. As expected, the correlation coefficients lacked the predictive power attained by all 31 variables. The coefficients of correlation are presented at the bottom of Table 11. The beta weights of the six factors on the proportion of the pupil population base per county receiving each kind of special education service studied are also presented in Table 11.

TABLE 11
Beta Weights and Multiple Regression Coefficients of Six Factors on Criteria

		Proportion of Children Served			
Factors	*Deaf*	*Speech Correction*	*Elementary EMH*	*Secondary EMH*	*Director*
Urban	.39	.39	.32	.09	.54
Education	.13	.02	—.03	.06	.11
Socioeconomic Status	.22	.21	.42	.28	.08
Rural Occupations	.00	—.20	—.34	—.01	—.04
Financial Ability	—.19	—.16	—.25	—.05	—.14
Population Growth	—.11	—.08	—.15	.03	—.12
Multiple Correlation	.52	.52	.70	.31	.59

Examination of the beta weights in terms of predicting for deaf services revealed that the heaviest positive weights were on the urban, socioeconomic status, and education factors, in that order. This means that programs for the deaf are more likely to be found in urban counties where the socioeconomic status and education levels are high. Negative beta weights were obtained for the financial ability and population growth factors. The beta weight for the rural occupations factor was zero. This suggests that counties providing services for deaf children are not characterized by high financial ability, population growth, or rural occupations.

Beta weights used for the prediction of speech correction services had positive loadings on the urban, socioeconomic status, and education factors. This suggests that speech correction services would tend to be provided in counties with these characteristics. The beta weights for the rural occupations, financial ability, and population growth factors were negatively weighted.

In the prediction for elementary classes for educable mentally handicapped children, the beta weights were positively weighted on the socioeconomic status and urban factors. Negative beta weights were obtained for the rural occupations, financial ability, population growth, and education factors. There seems to be a positive relationship between high socioeconomic counties in urban areas and the presence of elementary classes for educable mentally handicapped children. On the other hand, rural counties seem to lack this service, even when they possess financial ability, population growth, and an educated population.

In the prediction of secondary services for educable mentally handicapped children, positive beta weights were obtained for the socioeconomic status, urban, education, and population growth factors. Although these beta weights were small, they suggest that secondary programs would tend to be provided in counties with high socioeconomic and urban characteristics where the residents are well educated. Negative beta weights were found for the financial ability and the rural occupations factors.

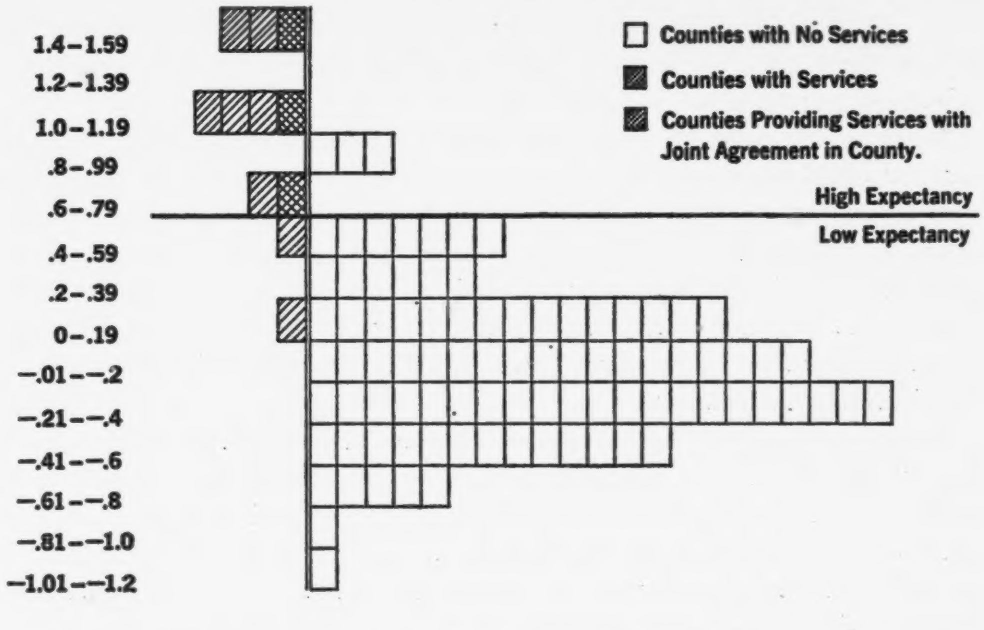
Beta weights for predicting the services of a director had positive weights for the urban, education, and socioeconomic factors. Negative weights were obtained for the financial ability, population growth, and rural occupations factors. The services of a director would be expected in urban areas where the socioeconomic status and the education levels of the population are high.

Expectancy Index for Deaf Services

An index was developed to provide a comparative measure of the expectancy of counties to support public school programs for deaf children. The index was based on the six factors generated from the factor analysis: urbanization, education level, socioeconomic status, rural occupations, financial ability, and population growth. The index score for each county was obtained by (a) determining the six factor scores for each county and (b) weighting the factor scores with the beta weights obtained for each factor on public school services for deaf children. The factor scores for each county are presented in Appendix A. The index scores for services for the deaf for each county are presented in Appendix B.

Figure 2 shows that, of a total of 101 Illinois counties, the expectancy index identified 12 as capable of supporting services for deaf children. These counties fell above the cutting point of .4 and were called high expectancy counties. The expectancy index also identified 89 counties in which one would not expect to find services for deaf children. These were called low expectancy counties and fell below the cutting point. The cutting point which differentiated high and low expectancy counties was determined by inspection and placed at a point which minimized the number of counties not fitting the prediction.

FIGURE 2. Expectancy Index of Services for Deaf in Illinois Counties



The degree of effectiveness and efficiency of prediction may be determined as illustrated in Figure 3.

High Expectancy Counties. Of the 12 counties expected to support public school services for deaf children, only Kane, McLean, and St. Clair Counties did not provide services for the deaf, even though all three had high expectancy scores and both Kane and St. Clair Counties were heavily loaded on the urban factor. The latter two counties are both adjacent to large metropolitan statistical areas which have a long history of programs for the deaf. Kane County is adjacent to the large standard metropolitan area consisting of Cook and DuPage Counties and has a history of transporting children to classes for the deaf located in these counties. St. Clair County is adjacent to the greater St. Louis area, which has a number of facilities for deaf children, including The Central Institute for Deaf, St. Joseph Institute for Deaf, St. Louis Hard of Hearing Classes, the Gallaudet Day School, and a large public school program. Deaf children from St. Clair County have attended those classes, as well as the Illinois State School for the Deaf in Jacksonville.

FIGURE 3. Degree of Effectiveness of Index Prediction

	With Services	*Without Services*
High Expectancy	9	3
Low Expectancy	2	87

$$\text{Effectiveness} = \frac{\text{9 High Expectancy Counties Actually Providing Services}}{\text{11 High and Low Expectancy Counties Providing Services}} = \text{82 Percent}$$

$$\text{Efficiency} = \frac{\text{9 High Expectancy Counties Actually Providing Services}}{\text{12 High Expectancy Counties for Which Services Had Been Predicted}} = \text{75 Percent}$$

The fact that St. Clair County had one of the lowest education factor scores in the state might be reflected in local attitude toward public school support. A population that has a low level of education may not be concerned about establishing a special education program for a comparatively small number of deaf children, particularly if facilities exist nearby.

Although McLean county had a high expectancy score, it did not provide public school services for deaf children. There were four classes for deaf children, but these were operated by Illinois State University. Since McLean County is dominated by the city of Bloomington and the remainder of the county is rural, the deaf classes at the University probably met the needs of the residents.

Low Expectancy Counties. Eighty-nine counties fell below the cut off point and were identified as low expectancy counties. Of this group, only Adams and Tazewell Counties had programs for deaf children.

Geographically, Adams County is the only county on the west central side of the state with a large city. According to the 1960 report of the Bureau of the Census, the city of Quincy had a population of 43,793 persons. The area surrounding Quincy for nearly 100 miles is sparsely populated and is characterized by small towns. Since Quincy has the only population center of any size in that section of the state, it is in a position to provide services and leadership for the surrounding area.

For a number of years, Quincy has been the site for the Quincy Youth Development Project, which has been financed by the Moorman Foundation and contributions from other sources. This additional financial support is not reflected in the financial ability factor. The attention focused on Quincy as a result of these studies has probably stimulated interest and pride in the educational program as well as assisted in the financial support of the schools. The combination of additional funds with the state and national attention resulting from the Quincy project, coupled with the fact that Adams County is borderline between high and low expectancy counties, may help explain the presence of classes there.

Tazewell County represented an extreme exception, because 31 nonsupporting counties had expectancy index scores equal to or higher than that of Tazewell. Examination of the factor scores for Tazewell County revealed positive factor scores on the urban, education, financial ability, and population growth factors. Tazewell County is also located in a standard metropolitan area. The combined presence of these factors may have helped create a climate conducive to the organization of classes. The initial impetus for establishing the classes seems to have come from two teachers of the deaf who resided in Pekin. In view of the paucity of teachers for deaf children, the presence of these teachers in the community may have contributed to the initiation of the program.

Summary of Services for Deaf.

1. Of the 11 counties in which public school services for deaf children were found, the expectancy index correctly identified 9 high expectancy counties. The expectancy index, therefore, was 82 percent effective in identifying counties with services.
2. A total of 12 counties was identified as high expectancy counties. Since 9 counties had public school classes for deaf children, the

expectancy index was 75 percent efficient in correctly identifying high expectancy counties that supported services.

3. Population size appeared to be the most important factor related to the support of programs for deaf children in Illinois counties. All of the 11 counties with deaf classes had positive scores on the urban factor. Ten of the 11 counties supporting programs for the deaf were located in standard metropolitan areas as defined by the US Bureau of the Census (1960).
4. The geographic proximity of counties with large urban centers may preclude the presence of public school classes for the deaf in adjacent high expectancy counties. Deaf children may be transported from nearby counties to the special public school or private classes in the urban center.
5. The presence of a university training program in audiology or in the education of the deaf may have implications for public school provisions for deaf children in Illinois counties. The presence of a university hearing center in a county provides greater accessibility to consultative, diagnostic, and evaluative services. Furthermore, public school programs for deaf children may be stimulated by the presence of university training programs for teachers of the deaf, particularly if student teachers receive their practicum experiences in the public school classes.

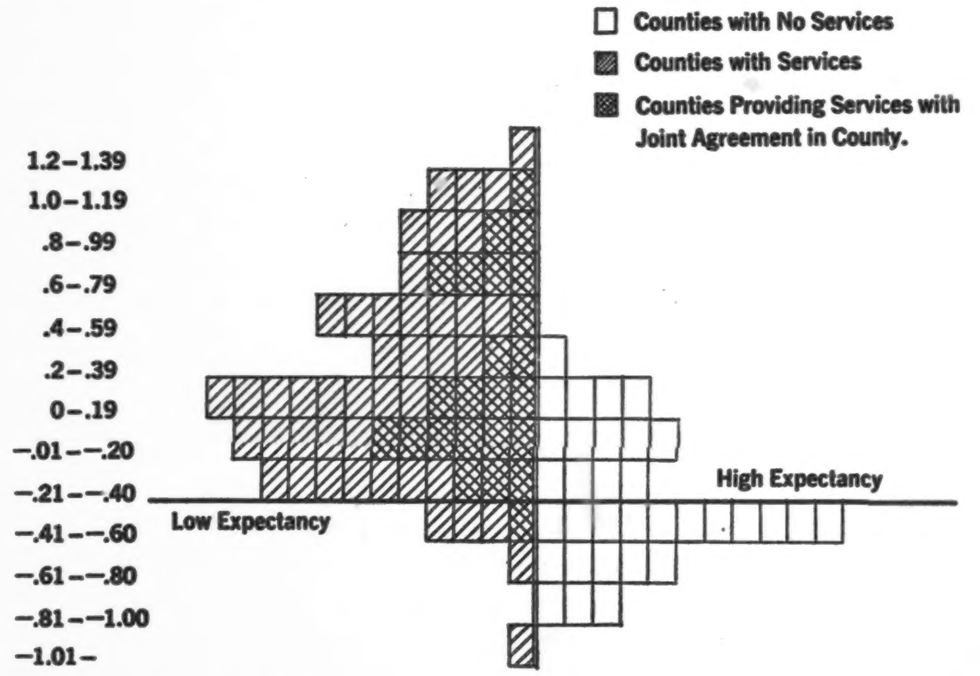
   In Champaign County, for example, the University of Illinois utilized the public school program for practicum experiences for student teachers. It should be noted that the number of children served in classes for the deaf exceeded expectations as estimated from the pupil population base. This may be explained by deliberate migration of families with deaf children to the Champaign area. Deaf children from neighboring counties are also transported daily to the special classes in Champaign. Cooperation between a university and the local school district can be mutually supportive. Classes for deaf children operated by universities for teacher training purposes may tend to repress the organization of classes for deaf children in the public schools, particularly if the felt need is being met by the university classes.

Expectancy Index for Speech Correction Services

The distribution of Illinois counties in Figure 4 shows that public school services for speech handicapped children were provided in 68 counties and were not provided in 33 counties. The cutting point differentiating high expectancy from low expectancy counties was placed at —.21. Of the 68 counties which supported speech correction programs, 62 were identified as high expectancy counties. The index, therefore, was 91 percent effective in identifying counties with speech correction services. Of the 76 counties identified as high expectancy counties, 62 had programs for speech correction. The index was 82 percent efficient in identifying high expectancy counties where services were provided.

High Expectancy Counties. Of the 76 high expectancy counties, 62 actually provided public school speech correction services, while 14 did not support such programs. Examination of the factor scores for high expectancy counties revealed that 48 counties had an urban factor score in the — .25 to + 5.36 range. Of these, 44 counties had speech correction services. Thus, it would seem that counties with urban factor scores within the — .25 to + 5.36 range would tend to have speech correction programs.

FIGURE 4. Expectancy Index of Speech Correction Services in Illinois Counties



There were five high expectancy counties that had urban factor scores ranging from — .25 to — .85. Four of these counties—Douglas, Edgar, Effingham, and Woodford—had speech correction services, while the fifth one, Bureau County, did not. Although these counties had low negative urban factor scores and negative scores on the rural occupations factor, they had positive scores on the education, socioeconomic, and population mobility factors. These positive factor scores seemed to overcome the deficiency in the urban factor.

Of the 14 high expectancy counties that did not have speech correction programs, 12 had negative urban factor scores. Only Kendall and Whiteside Counties had slight positive scores on the urban factor. Twelve high expectancy, nonproviding counties were also positively loaded on the rural occupations factor; the two exceptions were Iroquois and DeWitt Counties. The high expectancy, nonproviding counties, therefore, seemed to be nonurban counties characterized by residents engaged in rural occupations.

A factor pattern was identified among high expectancy counties that seemed to repress the development of programs. A negative urban factor score ranging from — .25 to — .84, with negative factor scores on either the education or financial ability factor or both, was found among 20 high expectancy counties. Eight counties did not provide speech correction services. Of the 12 counties that did, joint agreements were found in six counties: Case, Clark, Fayette, Moultrie, Union, and Warren. The presence of this factor pattern seems to suppress the development of services even in high expectancy counties.

Low Expectancy Counties. The index identified 25 counties as low expectancy counties for speech correction services. Only 6 of these counties supported speech correction programs, while 19 did not.

Two factor patterns were observed among 23 of the 25 low expectancy counties. Of the 23 counties possessing these patterns, 17 did not have speech correction services. The first factor pattern consisted of a negative urban factor score ranging from —.26 to —.84, but a positive score on the education, rural occupations, and financial ability factors. Counties characterized by this factor pattern included: Hancock, Marshall, Menard, Mercer, Putnam, Stark, Jasper, and Piatt. Only Jasper and Piatt Counties had speech correction services; they also had positive factor scores on the education, rural occupations, and financial ability factors. In addition, Piatt County had a positive factor score on the socioeconomic factor.

The second factor pattern consisted of a negative urban factor score ranging from —.26 to —.84 and negative scores on either the education or financial ability factor or both. The following nonproviding counties had this factor pattern: Brown, Calhoun, Cumberland, Gallatin, Hamilton, Hardin, Henderson, Jo Daviess, Johnson, Pope, and Schuyler. The four counties providing services included Greene, Shelby, Washington, and Wayne. Shelby County was a member of a joint agreement program, and Washington County had an extremely high score on the financial ability factor. The factor scores did not seem to explain the presence of speech correction programs in Greene or Wayne Counties. Other variables must have been operating in these counties.

Summary for Speech Correction Services.

1. Of the 68 counties in which speech correction services were supported, 62 counties were identified as high expectancy counties. The expectancy index, therefore, was 91 percent effective in identifying counties with services.
2. A total of 76 counties were identified as high expectancy counties. Since 62 of these counties actually had speech correction programs, the index was 82 percent efficient in identifying high expectancy counties where services were provided.
3. Counties in which services were supported tended to have urban characteristics. The populations of these counties seemed to have higher education and socioeconomic status levels than did counties not supporting services. Population growth was also characteristic of these counties.
4. Counties in which services were not provided tended to possess nonurban characteristics. The populations of these counties were generally nonmobile and tended toward low education and low socioeconomic status levels. A high proportion of the population of the nonproviding county was often found engaged in rural occupations. The nonurban county sometimes had positive scores on financial ability for school support. The sparsity of pupils in nonurban counties sometimes resulted in a large number of dollars per child in assessed valuation.
5. Two factor patterns were often found among counties supporting services:

   Pattern A: Counties with an urban factor ranging from —.25 to +5.36.

   Pattern B: Counties with a negative urban factor score ranging from —.25 to —.84, positive scores on the education, socioeconomic, and population mobility factors, and a negative score on the rural occupations factor.

6. Two factor patterns often found among counties not supporting services were:

   Pattern C: Counties with a negative urban factor score ranging from —.25 to —.84, but with positive scores on the education, rural occupations, and financial ability factors.

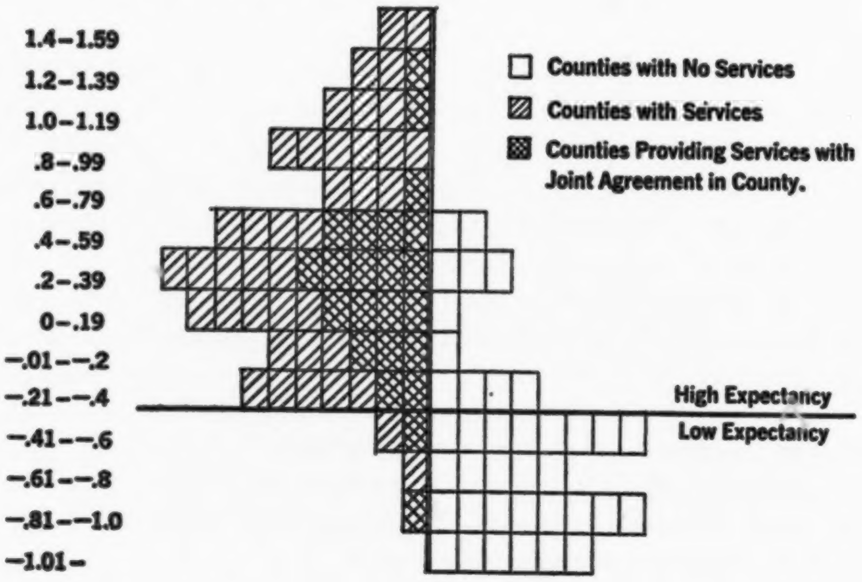
   Pattern D: Counties with a negative urban factor score ranging from —.25 to —.84, and negative scores on either the education or financial ability factor or both.

7. Knowledge of the factor patterns added information which helped differentiate the high expectancy counties that had services from those that did not.
8. Knowledge of the factor patterns among low expectancy counties did not seem to provide much additional information.
9. Joint agreements were found in 24 high expectancy counties where speech correction programs were supported. In low expectancy counties, however, joint agreements were found in only one county in which speech programs were supported. It seems the joint agreement legislation is being used by high expectancy counties, rather than by low expectancy counties. The small school district in the more densely populated high expectancy counties seems to have taken advantage of this legislation, whereas sparsely populated rural districts have not. Even when joint agreements have been entered into by low expectancy counties, they have usually satellized around a high expectancy county.

Elementary Classes for Educable Mentally Handicapped Children

Figure 5 presents the distribution of Illinois counties on the expectancy index for elementary educable mentally handicapped programs. This service was provided in 63 counties but was not provided in 38 others. The cutting point differentiating high expectancy from low expectancy counties was placed at —.21.

FIGURE 5. Expectancy Index of Elementary Classes for Educable Mentally Handicapped in Illinois Counties



Of the 63 counties which actually had elementary programs for the educable mentally handicapped, the index identified 59 as high expectancy counties. The index was 94 percent effective in identifying counties with programs. Although the index identified a total of 70 counties as high expectancy, only 59 of these had services. The index, therefore, was 84 percent efficient in identifying high expectancy counties where services were provided.

High Expectancy Counties. Of the 70 high expectancy counties, 59 actually provided public school services for educable mentally handicapped children at the elementary level, while 11 high expectancy counties did not provide this service.

Examination of the factor scores for high expectancy counties revealed that 46 counties had an urban factor score in the —.25 to +5.36 range. Of this group, 45 counties provided services and 1 did not. This suggests that counties falling within the —.25 to +5.36 range tend to support educational programs for educable mentally handicapped children.

Douglas, Edgar, Effingham, Woodford, and Bureau Counties had urban factor scores ranging from —.25 to —.85. Only Bureau County did not provide services. The positive factor scores these counties had on the education, socioeconomic, and population mobility factors seemed to overcome the deficiency of the urban factor.

All of the 11 high expectancy counties without elementary programs for educable mentally handicapped children had negative urban factor scores. Eight counties had positive scores on either the rural occupations factor or the socioeconomic factor. The nonproviding high expectancy counties, therefore, seemed to be nonurban counties where the residents were employed in rural occupations and had a high socioeconomic status.

A pattern of factor scores was identified among high expectancy counties that seemed to repress the development of services. A negative urban factor score ranging from —.25 to —.84, with negative scores on either the education or financial ability factor, or both, was found in 17 counties. Nine counties with this factor pattern did not provide services. Of the eight high expectancy counties providing services, Bond, Clark, and Warren Counties had joint agreement arrangements. It seems, therefore, that the presence of this factor pattern tends to repress the development of services, even among high expectancy counties.

Low Expectancy Counties. The index identified 31 counties as low expectancy counties for elementary programs for educable mentally handicapped children. Only four of these counties—Hancock, Moultrie, Shelby, and Wayne—supported programs. Of these, Moultrie and Shelby had joint agreement arrangements.

Summary for Elementary Programs for Educable Mentally Handicapped.

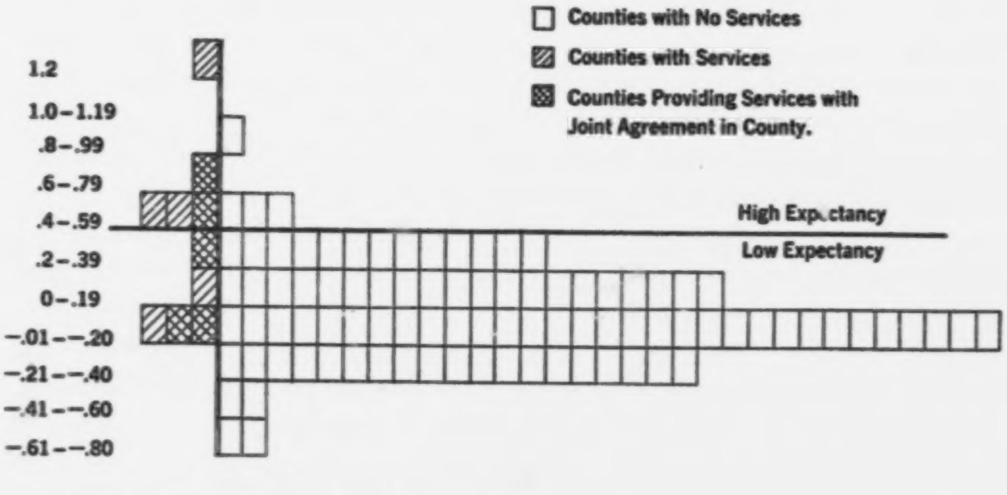
1. Of the 63 counties in which elementary programs were provided, the index identified 59 of them as high expectancy counties. The index, therefore, was 94 percent effective in identifying counties supporting services.
2. A total of 70 counties were identified as high expectancy, but only 59 had services. The index, therefore, was 84 percent efficient in identifying high expectancy counties providing services.

3-10. With one exception, findings 3 through 10 were identical to those found for speech correction services. The exception was that joint agreements were found in 23 counties that supported programs.

Secondary Classes for Educable Mentally Handicapped

Figure 6 presents the distribution of Illinois counties on the expectancy index for secondary classes for educable mentally handicapped children. Ten counties provided classes, while 91 did not. The cutting point differentiating high expectancy from low expectancy counties was placed at +.4.

FIGURE 6. Expectancy Index of Secondary Classes for Educable Mentally Handicapped in Illinois Counties



Of the 10 counties which supported secondary programs, 5 were identified as high expectancy counties. The index, therefore, was 50 percent effective in identifying counties with secondary classes. Of the 9 counties identified as high expectancy, only 5 had programs. The index was 56 percent efficient in identifying high expectancy counties with programs. The effectiveness and efficiency of the index in identifying counties with secondary programs for retarded children may have been reduced because of the small number of counties upon which the index was based.

The 10 counties supporting secondary programs for educable mentally handicapped children are in sharp contrast to the 63 supporting elementary, intermediate, and junior high school programs. One explanation for this large difference might be the practice of initiating classes for educable mentally handicapped children at the primary level and gradually extending the classes to the intermediate, junior high, and senior high school levels.

Another variable that might conceivably repress the secondary program is the establishment of separate elementary and secondary school districts. Because many educable mentally handicapped children drop out of school when they reach the legal age to do so, their prevalence is reduced at the secondary level. The secondary district, therefore, might not recognize the need to establish a secondary program. Also, the absence of an appropriate educational program for a retarded child may motivate him to withdraw from school as soon as possible. In a 12 grade school district where the needs of educable mentally handicapped children are being met at the elementary level, the probability is great that classes will be organized at the secondary level as those children advance to that point.

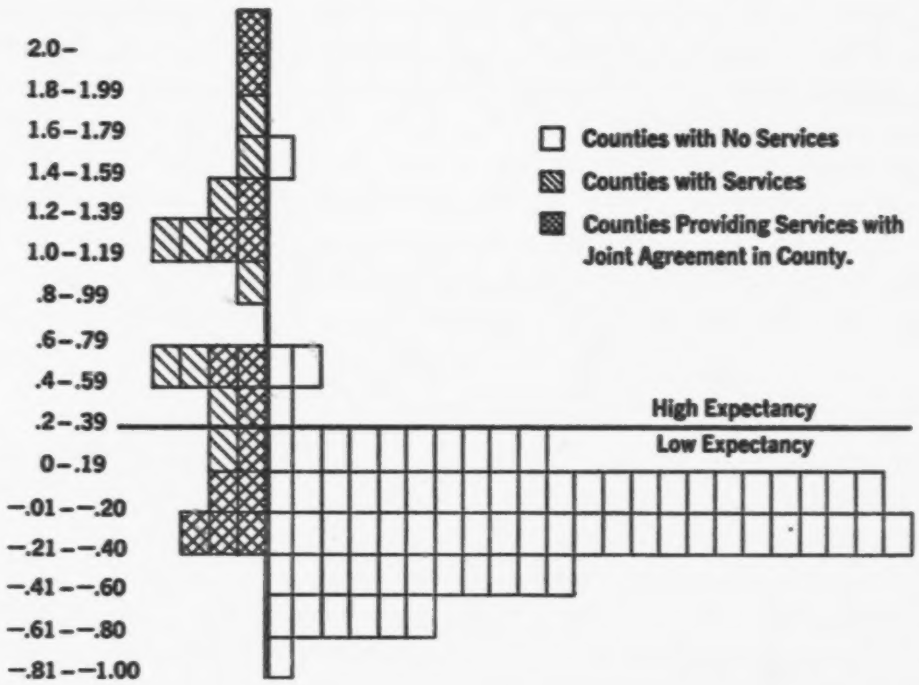
In view of the large number of counties presently operating educable classes at the elementary, intermediate, and junior high school levels, the next few years should find secondary programs being established in many of the counties now operating elementary and intermediate classes for educable mentally handicapped children.

In summary, it was found that counties providing secondary programs for the educable mentally handicapped tended to be urban with high education and socioeconomic levels. Universities, colleges, and junior colleges were found in six of the ten counties, and joint agreements were found in five. There were several low expectancy counties supporting services, for which no explanation could be found. Variables not identified here may have been responsible for the organization of programs in these areas.

Services of a Director of Special Education

The distribution of Illinois counties on the expectancy index for directors is shown in Figure 7. Twenty-four counties had the services of a director, while 77 did not. The cutting point differentiating high expectancy from low expectancy counties was placed at +.20. Seventeen of the 24 counties which had the services of a director were identified as high expectancy. The index, therefore, was 71 percent effective in identifying counties with the services of a director. Seventeen of the high expectancy counties had the services of a director; thus, the index was 81 percent efficient in identifying high expectancy counties supporting the services of a director.

FIGURE 7. Expectancy Index of Directors of Special Education in Illinois Counties



High Expectancy Counties. The four high expectancy counties which lacked directors' services included Adams, DeKalb, Sangamon, and Tazewell Counties. It should probably be noted that Adams County had the services of a director during the period in which this study was conducted, but the position was not approved for reimbursement by the State Office of Public Instruction. Although Sangamon County has had directors during previous years, there were no state approved directors working in the county during the time of this study. The factor scores did not offer an explanation for the absence of a director in DeKalb or Tazewell Counties.

Low Expectancy Counties. Eighty counties were identified as low expectancy counties. Of these, only seven, including Clark, Coles, Cumberland, Douglas, Morgan, Moultrie, and Shelby Counties, had the services of a director. All except Morgan were members of the same six county joint agreement program. Cooperative effort through joint agreement made it possible for these low expectancy counties to employ a trained professional person as director of special education.

Morgan County is exceptional in that the state school for the blind, the state school for the deaf, the Jacksonville Veterans Administration Hospital, the Jacksonville State Mental Hospital, McMurray College, and Illinois College are located in the city of Jacksonville in Morgan County. The presence of these institutions in Jacksonville may have had an impact on the educational philosophy of the community toward the need for special education services in the public school. First, a portion of the community's population works in the institutions. Second, the inmates sometimes work part time in the community as part of their training or rehabilitation. Third, the Jacksonville public schools have a long history of working cooperatively in the education of students from the state schools for the deaf and the blind. These variables may have created a favorable climate toward special education in Jacksonville and provided the initial impetus for the initiation of special classes and the acquisition of a director.

Summary for Services of a Director.

1. The expectancy index for directors correctly identified 17 of 24 counties which had the services of a director. Thus, the index was 71 percent effective in identifying counties in which these services were supported. The effectiveness score was reduced, however, by the presence of directors in 7 low expectancy counties. Six of these counties were members of a joint agreement program. The seventh was unique in that the director served a single community in which four institutions for the handicapped and two colleges were located.
2. A total of 21 counties were identified by the expectancy index as being high expectancy counties. Seventeen of these had the services of a director, and four did not. The index, therefore, was 81 percent efficient in identifying high expectancy counties in which the services of a director were actually supported.

   Several variables decreased the efficiency of the index. These included the presence of multicounty joint agreement programs among six low expectancy counties; a directorship in a high expectancy county which was not approved by the Office of the Superintendent of Public Instruction; and the temporary vacancy of a director in a nonproviding high expectancy county.

4

Summary

Several possible explanations have been offered to explain the presence or absence of public school provisions for special education services. These explanations typically include such variables as the number of children requiring services, socioeconomic variables, local attitudes, and various administrative problems. There is little objective evidence, however, that clearly defines which variables are related to the presence or absence of special education programs, or the extent to which these variables contribute to the presence or absence of special programs. Also, it is not known why some communities which seem to possess the resources for supporting special education programs have failed to do so, while others, seemingly lacking the resources for supporting educational programs, have been able to provide services.

The focus of this study, therefore, was placed upon economic and demographic variables and their relationships to public school provisions for children who are deaf, speech handicapped, or educable mentally handicapped. Provisions for administrative and supervisory services for special education programs were also studied in relation to economic and demographic variables.

The purpose of this study was (a) to determine the nature of factors which contribute to the presence or absence of special education services in the public school and (b) to develop a diagnostic technique to indicate whether or not counties could be expected to provide special education services.

Procedure

The provision of special education services in 101 Illinois counties was studied in relation to certain demographic and economic characteristics presumed to be related to these services. Cook County was omitted from this investigation because no other Illinois county approached Cook statistically. Analysis of the data when Cook County was included reflected the characteristics of Cook and eliminated many of the differences found to exist between counties when Cook was not included in the analysis.

Each area of exceptionality was selected for a specific purpose. The area of the deaf, for example, presents an area of very low prevalence, creating a number of administrative problems in organizing public school classes for deaf children. Speech correction represents an itinerant teacher service. Elementary and secondary programs for educable mentally handicapped were selected because of greater prevalence. Classes for the mentally handicapped often provide the core of the special education program. The area of administration was represented by the services of a director.

The measure of special education services per county for each area of exceptionality consisted of the proportion of the total pupil population base receiving the special service. The general formula for determining the criteria measures was:

$$\text{Proportion of the county pupil population base receiving special education services} \rightarrow \frac{\text{number of children receiving the special service}}{\text{county pupil population base}}$$

Thirty-one independent variables presumed to be related to the provision of special education services were selected. Their selection was based on economic and demographic data that are systematically and periodically compiled by county, state, or federal agencies.

Statistical Treatment. In order to study the relationships between the presence or absence of special education provisions in Illinois counties and the economic and demographic characteristics of a county, multiple regression and factor analysis techniques were used. A principal axis factor analysis with varimax rotation to orthogonal structure was used to reduce the 31 economic-demographic variables to a smaller number of more interpretable factors.

Multiple regression analysis was used to determine the relative strength of the economic and demographic variables in predicting the proportion of children per county receiving special education services in each area studied. Through the use of the 31 variables as predictors, a measure of maximum predictability was obtained. Multiple regression was also used to determine the strength of the six factors as predictors and to obtain beta weights for use in the development of the expectancy index.

The Special Education Expectancy Index. The expectancy index was developed to provide a comparative measure of the likelihood or expectancy of counties to support special education programs. An index was obtained for each area of exceptionality studied. The procedure for generating an expectancy index for any given area of exceptionality included:

1. Factor analysis of the 31 economic and demographic variables generated six factors.
2. Factor scores for the six factors were obtained for each county.
3. The six factor scores were then weighted with the beta weight for that factor on the particular area of exceptionality and summed. This provided a single index score for each county for that area of exceptionality.

$$\text{Index score} = \beta_1 f_1 + \beta_2 f_2 + \beta_3 f_3 + \beta_4 f_4 + \beta_5 f_5 + \beta_6 f_6$$

where β_k = beta weight for deaf services, and
f_k = a factor score for the K^{th} factor.

4. The counties were then rank ordered on a frequency distribution.
5. In order to differentiate high and low expectancy counties, the cutting point on the index was placed by inspection so as to minimize the number of counties not fitting the prediction.

Results

The factor analysis of the 31 variables generated six clusters of variables or factors. The factor loadings of each cluster were studied for the common element that seemed to describe it best.

The urban factor, which accounted for 44 percent of the variance, was the strongest factor. This factor was composed of variables that typically describe urban areas, such as population density, large numbers of children in average daily attendance, high family income, high education level, and a large proportion of the labor force engaged in manufacturing or white collar occupations. Those variables which describe rural areas, such as the proportion of people engaged in agricultural work or living in rural farm residence, had negative loadings on the urban factor.

The education factor, which accounted for 13 percent of the variance, had variables which related to educational attainment. The proportion of children completing high school or more, median school years completed, and the change in average daily attendance all reflected some measure of education. This factor had negative factor loadings for variables reflecting low educational attainment, such as families earning median incomes of less than $3,000 a year, high proportion of the population employed in transportation services, high unemployment, high proportion of nonwhite population, and a large proportion of the school age population completing five years of schooling or less.

The socioeconomic factor was described by variables which are frequently associated with high socioeconomic levels. These included a number of occupations which usually require formal education, such as teaching, white collar occupations, wholesale and retail trade, finance, insurance, and real estate. This factor accounted for 8 percent of the variance.

The rural occupations factor was characteristic of the income and occupations found in rural areas. A large proportion of the population tended to be employed in agricultural occupations. The median family income was low, and a high proportion of residents lived in rural areas. A large proportion of the population was employed in public administration. One explanation for this might be that the total number of persons employed in public administration does not seem to increase proportionately with the increase in population. Yet, the same kinds of public administrative posts seem to be required for both rural and urban counties. This factor accounted for 6 percent of the variance.

The financial ability factor accounted for 5 percent of the variance and was composed of variables which provided a measure of the equalized assessed valuation per child, along with measures of pupil population concentration. These included the number of children in average daily attendance in the largest district in the county, the proportion that the largest district represented in the total average daily attendance of the county, and the average daily attendance of the largest district in the county.

The population growth factor accounted for only 4 percent of the variance and included variables characteristic of counties passing through a period of growth. Counties with growing populations require large numbers of people engaged in construction work. Rapidly growing counties near metropolitan areas often have large numbers of people commuting to factories, businesses, and offices in neighboring metropolitan counties. Positive civilian migration causes population growth and is usually reflected in school attendance throughout a county.

Multiple Regression Analysis. The multiple regression coefficients obtained by using the 31 economic and demographic variables and the six factors as predictors are presented in Table 12.

The multiple correlation coefficients show that the 6 factors lacked the predictive power of the 31 economic and demographic variables. This was expected because the number of predictors was reduced, and although a variable may be heavily loaded on its factor, it does not necessarily correlate highly with the criteria variables.

Examination of the beta weights obtained from the multiple regression analysis in terms of prediction revealed that the urban and the

TABLE 12
Multiple Regression Coefficients

	Multiple Correlation Coefficients	
Kind of Service	*31 Variables*	*6 Factors*
Deaf	.74	.52
Speech Correction	.66	.52
Elementary Classes for Educable Mentally Handicapped	.81	.70
Secondary Classes for Educable Mentally Handicapped	.54	.31
Director	.73	.59

socioeconomic factor were positively weighted for all five areas studied. The education factor was positively weighted for all areas except elementary programs for educable mentally handicapped children.

Beta weights were negatively weighted for the financial ability and population growth factors on all services except secondary classes for educable mentally handicapped. The only area that was not negatively weighted on the rural occupations factor was that of the deaf. The beta weights suggest that counties with positive factor loadings on the urban, education, and socioeconomic factors tend to provide special education services, whereas counties with negative factor loadings on the rural occupations, financial ability, and population growth factors tend to provide special programs for a lesser proportion of their population base.

The financial ability factor was also found to have a negative beta weight with the proportion of children served. This is probably explained by the fact that rural, sparsely populated counties often have a greater number of dollars in assessed valuation per child than do more densely populated counties, because rural counties have fewer children among whom the assessed valuation is divided.

A negative beta weight was also found to exist between the population growth factor and the proportion of children receiving special education services. The concept of administrative lag in providing educational facilities and services may explain this relationship. In counties where population growth is extremely rapid, school administrators are faced with the problem of providing staff, classrooms, transportation, and other facilities to take care of the expanding school population. The demands made upon the total school program are often so great that administrators are forced to deal with the problems involving the greatest number of children. Thus, the provisions for special education services for a comparatively small proportion of the school population are subordinated to the necessity of trying to meet the pressing needs of the majority.

Special Education Index. An index was developed for each of the five special education services studied and was intended to differentiate between counties in which one would expect to find a special education service and those in which one would not expect to find these services. The effectiveness and efficiency of the index in differentiating high and low expectancy counties are presented in Table 13.

TABLE 13
Effectiveness and Efficiency of the Index

Special Service	*Maximum Percentage* *Effectiveness*	*Efficiency*
Deaf	82	75
Speech Correction	94	83
Elementary Classes for Educable Mentally Handicapped	94	84
Secondary Classes for Educable Mentally Handicapped	50	55
Director	71	81

In addition to providing an instrument to determine whether or not counties could be expected to provide services, the index serves as a diagnostic instrument. In many instances knowledge of the factor scores for Illinois counties helps to explain why a high expectancy county did not provide services or why a low expectancy county did provide services.

Pattern A: Counties with urban factor scores ranging from —.25 to +2.0 almost always provided services.

Pattern B: Counties with a negative urban factor score greater than —.25, positive scores on the education, socioeconomic, and population growth factors, and a negative score on the rural occupations factors also frequently provided services.

Two factor patterns were also found among counties not supporting services.

Pattern C: Counties with a negative urban factor score ranging from —.25 to —2.0, but with positive scores on the education, rural occupations, and financial ability factors often did not provide services.

Pattern D: Counties with a negative urban factor score ranging from —.25 to —2.0 and negative scores on either the education or financial ability factor, or both, seldom provided services.

In some counties other factor scores failed to explain why some high expectancy counties did not provide services or why some low expectancy counties did. This implies that deviations from expected provision of services may be related to elements which are not accounted for by the factors identified in this study.

Other characteristics of these counties were sought in an effort to explain why these counties were atypical. Several variables were identified that seemed to be related to the presence or absence of special classes.

1. The joint agreement plan made it possible for low expectancy counties in Illinois to provide special education services which otherwise might have been impossible.
2. Accessibility to special education facilities in large metropolitan centers seemed to repress the development of special education programs even in adjacent high expectancy counties, particularly if the counties were deficient in the education or the financial ability factors.
3. The presence of university teacher training programs in a county seemed to have the ability to either stimulate or retard the organization of special education programs in the public school. Not only does a university teacher training program provide diagnostic and consultative services, but it also reduces the teacher recruitment problem for nearby communities. If qualified teachers are not available, local teachers can easily receive training for certification because of the accessibility to the university or college. On the other hand, the presence of a university sponsored laboratory school for training teachers might repress public school programs, particularly if the local need for that service is met by the university class.
4. Examination of the counties participating in joint agreements revealed that this legislation has, for the most part, been applied by school districts in high expectancy counties. These counties were usually densely populated areas. The low expectancy counties that have established joint agreement programs have followed one of two courses. First, when low expectancy counties have entered into joint agreements, they have usually satellized around a high expectancy county that had a previous history of services. Second, when the school districts in low expectancy counties set up a joint agreement, it was usually for one given service or class. Either a single speech correctionist was employed or one special class was established. This kind of limited program does not provide a continuous educational program for the few children receiving services, nor does it provide for the educational needs of children requiring other kinds of services.

5

Discussion

The central problem of this investigation was to identify factors associated with public school support of different kinds of services for handicapped children. Urbanization was found to be the most important factor associated with the presence of special education services. This is not surprising, since a large population base is necessary to provide sufficient numbers of children to establish special education programs. Regardless of other factors, if counties were sufficiently urban, special education services were provided almost without exception. The absence of special education services in many rural counties further emphasized the importance of the urban factor. Counties with a high proportion of the population engaged in rural occupations and living in rural farm residence present severe administrative problems in identifying and bringing together sufficient numbers of children to justify special education services.

The education factor has a major implication for the development of special education programs. A well educated population may place a higher priority on the value of a sound education than might a poorly educated population. Thus, one would expect counties with an educated population to concern themselves with the education of their children and to improve the school program by supporting their superintendent and board of education.

Counties with a high socioeconomic status factor are usually characterized by well educated populations that are employed in white collar or professional occupations. This provides the happy combination of attitudes favorable to education and the financial ability necessary for school support. The financial ability factor provides a rough estimate of potential wealth for school support. Whether or not a population makes the financial effort to support the school program, the potential must be present before the effort can be made. There are many school districts that have taxed themselves to the legal limit set by the state, yet still are unable to provide adequate financial support for school programs.

The population growth factor has two implications for special education services. First, during a period of rapid population growth, an educational lag may develop between the services needed and the services provided. This lag may occur because the public school is concentrating on building facilities and employing teachers in an effort to keep pace with the expanding population. Second, following a period of rapid population growth, sufficient numbers of exceptional children may be identified to establish classes. When the rate of population growth is reduced, the public school may be able to reduce the lag between need and services provided.

From the above, it becomes apparent that factors such as urbanization, education, socioeconomic status, rural occupations, financial ability, and population growth have implications for the planning of special education services. Knowing what the demographic and economic factors are in providing special education services has several implications for the organization of community resources for education. In discussing the implications of these factors for the public schools in Illinois, however, it is necessary to relate them to the situation. This requires a brief discussion of the ways in which special education programs have been implemented in Illinois.

Implementation of Special Education Programs

There are three basic administrative procedures for providing special education services. First, the individual school district may provide programs; this method is usually applied by large school districts. Second, the small school districts which are unable to support specialized services sometimes transport pupils to programs operated by larger districts. Third is the joint agreement plan, whereby two or more school districts share the responsibility for planning and operating the specialized program.

The advantage of the joint agreement plan is that it provides low expectancy districts and counties with the means to provide cooperative special education programs. The joint agreement has been successfully implemented by a number of counties. Unfortunately, Illinois counties which have entered into joint agreement arrangements have been, for the most part, high expectancy counties with a tendency toward urban characteristics. Many of these counties are either in standard metropolitan areas or adjacent to standard metropolitan areas. The few low expectancy counties that have entered into joint agreement arrangements have usually satellized around high expectancy counties in which services previously existed. In effect, the joint agreement has not been used by nonurban, low expectancy counties except as satellites to high expectancy ones. In a few instances, single class programs have been established by joint agreement. A one class program for one area of exceptionality represents a limited approach to meeting the needs of exceptional children.

The fact that low expectancy counties have not exercised their discretion in using the joint agreement plan under permissive law has severe implications for the effectiveness of this kind of solution for the low expectancy county. Apparently, presenting nonurban, low expectancy counties with the legal means of transporting children to cooperative classes supplemented by a state supported reimbursement program is not sufficient to expect wide scale implementation of legislative provisions.

Legal provisions, such as the joint agreement plan, provide the means for organizing cooperative programs. They do not necessarily take into account, however, the factors that are related to the community organization of special education programs.

Implications

The major implication of this investigation concerns the organization of community resources in mobilizing low expectancy counties for providing specialized educational services. The results suggest that it is not sufficient to provide legislation permitting school districts to establish cooperative programs under permissive law. This investigation has identified a number of low expectancy counties that would not be able to support specialized programs, even if they were ordered to do so under mandatory law. To be successful, legislative or administrative provisions should be based on those factors that are related to the support of special education services.

The special education expectancy index provides the means for studying counties in terms of economic and demographic resources related to public school provisions for exceptional children. The index can be used (a) to predict the expectancy of counties to provide special education services, (b) to compare objectively the expectancy of counties to provide services, and (c) to provide a differential diagnosis of the factor assets or deficits of specific counties. Because the index is based on data that are easily accessible and the procedures for obtaining an index have been developed in this study, it would be possible to obtain an index for a state in a very short time.

The index would be potentially useful at both the state and local levels. If an intermediate administrative unit existed, the index would also be useful at that level. A state board of education or an advisory committee could use the index for recommending legislative provisions for low expectancy counties which are unable to support specialized programs. For example, the socioeconomic status and financial ability factors identified in this study emphasize the need for a more adequate financial base for school support among low expectancy counties. This might include provisions for a reimbursement plan based on need or a major revision in the tax structure for school support.

The importance of the urban factor stresses the need for enlarging pupil population bases. This has implications for the organization of multidistrict, county, or multicounty arrangements to support special education services. In lieu of placing complete responsibility for planning and organization at the local level, there seem to be several advantages in coordinated statewide planning by a state board of education or an advisory committee. First, those involved in study or planning would hopefully be knowledgeable in the problems and factors which should be considered. Second, a coordinated statewide study based on objective criteria would provide several alternative plans, which would insure that every district or county was included in a program that had the necessary economic and demographic base for operation.

The concept of the intermediate administrative unit offers a realistic solution to many of the problems confronting not only special education, but other educational programs as well. The intermediate unit is a broad and flexible concept which is in the direct line of state school organization. The regional agency can be applied in a number of ways to mobilize the resources of low expectancy counties to meet the educational needs of exceptional children.

Regardless of whether the intermediate administrative unit assumes responsibility for providing services to school districts that are unable to provide the service themselves, or whether the intermediate unit assumes only administrative responsibility, the need exists for an administrative unit to act between the state and local district level and mobilize community resources for public education.

Limitations

The lack of an operational model presented the greatest limitation in conducting this study. A number of problems were encountered in developing rationale and procedure.

Although the school district in Illinois is the basic unit for public education, the kinds of data with which this study was concerned are not available for school districts. The county was selected as the basic unit for study because it represents the smallest administrative unit for which economic, demographic, and educational data are available. The county or parish is found in all states and can be used in conducting interstate studies. The primary disadvantage of the county is that it represents a political and geographic unit that was created for political and not educational purposes.

In the absence of information concerning demographic and economic variables presumed to be related to special education services, it was necessary to review and study a large number of variables. Judgments were made on the basis of this evaluation, and the variables judged to be related to special education services were factor analyzed. All variables selected for study were factor analyzed and revealed six factors which were related to the provision of special education services. If other kinds of variables were factor analyzed, additional factors might have been found which also relate to educational provisions.

A logical extension of this study would be the refinement of the factors. Having identified six factors which represent new entities, it is now possible to seek variables which provide better measures of those factors. Also, the factor analysis of other kinds of variables may reveal new factors which are related to the provision of special educational services.

Since this study was limited to one state, the extent to which the results may be applied to other states is questionable, particularly if those states differ in demographic, economic, or geographic characteristics. This issue can be resolved by conducting cross validation studies in states of different demographic and economic characteristics. These studies would also determine whether or not the same factors can be used to identify atypical counties in other states with the same degree of efficiency and effectiveness as they did in Illinois.

Since large metropolitan statistical areas like Cook County are often atypical in comparison with the rest of the state, they should be studied in comparison with each other and not with the counties of the state in which they are located. With population density eliminated as a critical factor, researchers could focus on the effects of other variables on program support.

Additional research is needed to identify the factors operating in atypical counties for which no obvious explanation has been found. When the factors identified by this study fail to explain the presence or absence of a service in an atypical county, other variables must be operating. Intangible variables such as local leadership and community pressure groups probably stimulate or repress the development of special programs. By studying atypical, unexplained counties in depth, variables of a less obvious nature and the conditions giving rise to these variables might be identified.

Finally, the index can be used to match counties or states with similar potential ability and can be used on different factors for purposes of comparative intrastate and interstate studies. Studies could be conducted comparing states with different administrative organization, legislative provisions, policies, and standards. This kind of study would provide objective data for evaluating the efficacy of different administrative approaches to the problem of meeting the educational needs of exceptional children.

References

Dawson, H. A., & Ellena, W. J. *The status of school districts and school district reorganization*. Washington, D.C.: Department of Rural Education, NEA, 1954.

Deffenbaugh, W. S., & Covert, T. *School administrative unit*. Washington, D.C.: US Government Printing Office, 1933.

Dickman, K. W. Factorial validity of a rating instrument. Unpublished doctoral dissertation, Univer. of Illinois, 1960.

Dunn, L. M. (Ed.) *Exceptional children in the schools*. New York: Holt, Rinehart & Winston, 1963.

Educational Policies Commission. *The structure and administration of education in American democracy*. Washington, D.C.: National Education Association, 1938.

Fitzwater, C. L. *School district reorganization: policies and procedures*. Washington, D.C.: US Department of Health, Education, & Welfare, 1957.

Illinois School Problems Commission Number 7. *Illinois school problems*. Springfield: Illinois Legislative Council, 1963.

Kaiser, H. F. The varimax criterion for analytic rotation in factor analysis. *Psychometrika*, 1958, **23**, 187-200.

Kaiser, H. F. Formulas for component scores. *Psychometrika*, 1962, **27**, 83-87.

Kirk, S. A. *Educating exceptional children*. Boston: Houghton Mifflin, 1962.

Mackie, Romaine P. Spotlighting advances in special education. *Except. Child.*, 1965, **32**, 77-81.

McLure, W. P. *The intermediate administrative school district in the United States*. Urbana: Univer. of Illinois, 1956.

National Commission on School District Reorganization. *Your school district*. Washington, D.C.: Department of Rural Education, NEA, 1948.

New York State Education Conference Board. *Quality of education and size of school district*. Albany: Author, 1956.

Page, R. *Rules and regulations to govern the administration and operation of special education*. Springfield, Ill.: State Department of Education, 1964.

Sumption, Merle R., & Beem, H. *A guide to school reorganization in Illinois*. Urbana: Univer. of Illinois, 1947.

US Bureau of the Census. *U.S. census of population: 1960 general population characteristics, Illinois*. Washington, D.C.: US Government Printing Office, 1961.

Appendix A

Factor Scores per County, Services for the Deaf

County	*I* *Urban*	*II* *Education*	*III* *Socioeconomic Status*	*IV* *Rural Occupations*	*V* *Financial Ability*	*VI* *Population Growth*
Adams	.19	.39	.01	—1.11	—1.40	—.39
Alexander	—.08	—3.87	1.85	.40	—.45	—.42
Bond	—.69	.13	—.15	—.54	—1.85	1.52
Boone	—.05	1.25	—.99	—1.56	—1.07	.85
Brown	—.82	.62	—.29	1.92	—1.70	.00
Bureau	—.43	.36	.00	—.67	1.26	.42
Calhoun	—.79	.35	—.91	.19	—1.93	4.14
Carroll	.02	.18	.70	2.16	1.33	—1.21
Cass	—.32	—.59	.85	.20	—.41	.34
Champaign	.66	1.33	4.21	1.52	—.15	—.37
Christian	—.10	.16	—.09	.23	—.03	—.60
Clark	—.59	—.25	—.26	—.37	—.56	.64
Clay	—.63	—.53	—.03	—.11	.42	—.28
Clinton	—.02	—.42	—1.14	.72	.44	.30
Coles	—.13	—.05	1.66	—1.16	—.52	.07
Crawford	—.44	.48	—.21	—1.31	—.63	.14
Cumberland	—.48	.41	—2.09	.60	—.56	—.42
DeKalb	.07	1.49	.88	—.93	.31	—.19
DeWitt	—.34	.12	1.28	.09	—.02	.56
Douglas	—.38	1.00	.55	—.40	.50	.35
DuPage	5.36	.51	.21	2.46	1.83	3.31
Edgar	—.50	.25	.71	—.14	—.19	.11
Edwards	—.64	.28	—1.28	.67	—1.46	—.24
Effingham	—.38	.06	.67	—.43	—1.00	.89
Fayette	—.53	—.31	—.40	.63	—.66	.03
Ford	—.22	1.11	1.00	1.59	.16	—.17
Franklin	—.23	—2.22	.44	—.57	.13	.03
Fulton	—.20	.54	—.59	—.52	.11	—1.32
Gallatin	—.84	—1.24	—.96	1.18	.03	—.63
Greene	—.64	—.11	—.53	.21	.10	—.11
Grundy	—.10	.33	—.15	—1.42	1.36	1.06
Hamilton	—.70	—.40	—1.73	.91	.19	—.50

Hancock	—.65	.82	.27	.59	.65	.38
Hardin	—.72	—1.19	.55	—.02	.16	.31
Henderson	—.77	1.52	—.71	1.15	—.31	.59
Henry	—.08	.15	—.16	—.56	.34	—.23
Iroquois	—.50	.73	—.23	.21	.75	—.30
Jackson	—.24	—.34	3.13	—.11	.18	.90
Jasper	—.77	.19	—1.03	.04	.47	—.36
Jefferson	—.20	—.95	.44	.02	.21	—1.25
Jersey	—.21	.52	—.58	—.40	—1.59	.81
Jo Daviess	—.30	.69	—.84	1.40	—.05	—.55
Johnson	—.71	—1.37	—.25	1.05	.32	.76
Kane	2.45	.35	—.73	—.44	—.33	—.36
Kankakee	.67	—.41	—.66	—1.46	—.01	—.42
Kendall	.09	1.63	—.75	—1.06	.71	1.34
Knox	.16	.48	1.00	—.77	—.50	—1.34
Lake	3.91	.28	—.20	1.19	.91	1.48
LaSalle	.48	—.10	—.62	—1.62	1.44	—.87
Lawrence	—.45	—.43	.33	—.77	.79	.14
Lee	—.11	—.01	.24	—.76	—.22	.31
Livingston	—.24	.45	.11	.06	1.36	—.08
Logan	—.25	—.59	—.23	—.76	1.75	—.36
Macon	1.13	.22	.82	—.30	—1.74	—1.50
Macoupin	—.12	—.47	—.50	.02	.30	.09
Madison	1.96	—.77	—1.47	—.54	—.16	—.87
Marion	—.17	—1.34	.88	—.74	.68	—.51
Marshall	—.58	.80	—.28	.43	1.32	—.86
Mason	—.50	.48	1.05	.64	.35	—.44
Massac	—.43	—2.05	.66	—1.01	.88	.48
McDonough	—.53	1.01	1.89	.12	.14	—.94
McHenry	.83	.85	.39	—1.68	1.11	2.12
McLean	.30	1.07	2.29	.09	—.01	—1.12
Menard	—.29	.50	.20	2.29	.07	—.44
Mercer	—.55	1.29	—.46	.90	.21	—.61
Monroe	—.10	.05	—.39	—.64	—.18	1.66
Montgomery	—.31	—.16	—.43	—.29	—.34	—.41
Morgan	—.17	.44	1.69	—.46	—.76	.30
Moultrie	—.37	.69	—1.16	—.31	—.45	.50
Ogle	—.24	1.09	—.54	—.93	.98	.27
Peoria	1.63	—.03	.05	—.85	—.91	—1.71
Perry	—.47	—1.11	—.42	—1.23	.07	.88
Piatt	—.48	.78	.93	.67	1.87	.55
Pike	—.68	.41	—.23	.32	—.84	.82
Pope	—.50	1.69	—.45	2.39	—1.84	1.46
Pulaski	—.08	—3.87	.17	1.83	.71	—.23

Putnam	—.69	.02	—.64	—.07	3.17	.59
Randolph	—.14	—.93	—1.00	.18	.45	—.67
Richland	—.44	.05	.37	—.10	—1.53	—.19
Rock Island	1.43	.20	—.42	—1.01	—.35	—1.72
St. Clair	2.75	—2.04	—1.00	.86	—.55	—.98
Saline	—.48	—2.08	1.25	—1.00	—.14	1.53
Sangamon	1.62	.24	1.19	1.71	—2.15	1.86
Schuyler	.66	1.36	—1.42	1.30	—2.02	.45
Scott	—.62	.28	.16	1.26	—1.07	1.51
Shelby	—.46	.27	—1.15	.58	—.01	—.18
Stark	—.83	1.33	—.50	1.24	2.20	—1.12
Stephenson	.17	1.16	—.62	—.49	—.87	—2.37
Tazewell	.86	.27	—.35	—1.83	.78	.38
Union	—.51	—.90	—.49	—.73	.02	.81
Vermillion	.50	—.43	.02	—1.08	—.49	—1.07
Wabash	—.22	—.29	.89	—.70	—1.23	—.07
Warren	—.45	1.08	1.19	.04	—.08	—.10
Washington	—.64	—.53	—1.55	1.06	2.26	—.81
Wayne	—.57	—.41	—.87	.54	.45	—1.15
White	—.55	—.45	.33	—.02	.37	—.38
Whiteside	.12	.32	—.63	—1.50	.68	—.59
Will	2.11	—.21	—.45	—.34	—.23	.62
Williamson	—.12	—1.45	.14	—1.52	—.66	.31
Winnebago	2.32	.22	—1.27	—1.09	—1.64	—1.27
Woodford	—.40	.90	.96	—.32	.59	.72

Appendix B

Index Scores per County, Services for the Deaf

County	*Services for Deaf*	*Speech Correction Services*	*Elementary EMH Services*	*Se[redacted] EMH Services*	*Services of a Director*
Adams	.44	.56	.84	.12	.43
Alexander	.00	.30	.90	.30	—.24
Bond	—.09	—.01	.13	.05	—.28
Boone	.04	.21	.20	—.12	.15
Brown	.04	—.47	—.64	—.05	—.25
Bureau	—.42	—.27	—.29	—.07	—.39
Calhoun	—.54	—.55	—.84	—.10	—.69
Carroll	.06	—.39	—.59	.08	—.05
Cass	.03	.04	.26	.21	—.16
Champaign	1.42	.91	1.54	1.30	.83
Christian	.04	—.05	—.06	—.04	.02
Clark	—.28	—.18	—.12	—.09	—.35
Clay	—.37	—.29	—.23	—.13	—.42
Clinton	—.43	—.49	—.88	—.37	—.27
Coles	.41	.61	1.20	.50	.18
Crawford	.05	.14	.34	—.02	—.07
Cumberland	—.43	—.61	—1.06	—.60	—.28
DeKalb	.37	.39	.62	.33	.29
DeWitt	.10	.07	.32	.35	—.14
Douglas	—.04	—.04	.05	.16	—.14
DuPage	1.50	1.10	.03	.53	2.25
Edgar	.02	.01	.21	.18	—.17
Edwards	—.18	—.39	—.59	—.34	—.22
Effingham	.10	.16	.42	.24	—.10
Fayette	—.21	—.32	—.39	—.15	—.29
Ford	.27	—.18	—.23	.29	.01
Franklin	—.31	.05	.33	—.02	—.33
Fulton	—.01	.00	.01	—.19	.07
Gallatin	—.63	—.74	—.96	—.45	—.65
Greene	—.39	—.41	—.51	—.22	—.41
Grundy	—.41	—.08	—.11	—.06	—.27
Hamilton	—.68	—.81	—1.23	—.61	—.57
Hancock	—.26	—.44	—.54	.03	—.40

Hardin	—.62	—.47	—.51	—.29	—.62
Henderson	—.26	—.64	—1.00	—.16	—.38
Henry	—.09	.01	.04	—.06	—.03
Iroquois	—.26	—.36	—.49	—.12	—.28
Jackson	.41	.47	1.12	.86	—.05
Jasper	—.55	—.74	—1.03	—.40	—.54
Jefferson	—.01	.05	.27	.01	—.07
Jersey	.08	.08	.08	—.04	.04
Jo Daviess	—.14	—.50	.86	—.25	—.14
Johnson	—.65	—.68	—.85	—.22	—.73
Kane	.94	.97	.74	.04	1.42
Kankakee	.11	.44	.51	—.14	.38
Kendall	—.20	—.10	—.34	—.10	—.04
Knox	.59	.62	1.05	.32	.43
Lake	1.19	.99	.33	.29	1.80
LaSalle	—.15	.22	.22	—.22	.18
Lawrence	1.33	—.10	.05	—.00	—.36
Lee	.01	.17	.34	.09	—.02
Livingston	—.27	—.29	—.39	—.04	—.25
Logan	—.53	—.26	—.28	—.22	—.38
Macon	1.16	1.08	1.46	.41	1.13
Macoupin	—.28	—.22	—.33	—.19	—.21
Madison	.48	.65	.38	—.29	1.02
Marion	—.13	.16	.51	.11	—.18
Marshall	—.34	—.50	—.68	—.18	—.35
Mason	.07	—.12	.03	.24	1.16
Massac	—.52	—.05	.26	.01	—.54
McDonough	.41	.23	.66	.51	.05
McHenry	.07	.41	.40	.25	.25
McLean	.88	.68	1.17	.70	.59
Menard	.04	—.49	—.76	.02	—.15
Mercer	—.12	—.45	—.68	—.14	—.19
Monroe	—.27	—.09	—.18	—.06	—.22
Montgomery	—.13	—.07	—.04	—.15	—.12
Morgan	.47	.48	.95	.54	.17
Moultrie	—.28	—.28	—.49	—.28	—.20
Ogle	—.23	—.13	—.22	—.16	—.11
Peoria	1.01	1.10	1.31	.17	1.25
Perry	—.53	—.13	—.03	—.19	—.47
Piatt	—.31	—.46	—.55	.17	—.45
Pike	—.19	—.30	—.35	—.04	—.34
Pope	—.31	—.62	—.88	—.16	—.52
Pulaski	—.60	—.53	—.62	—.25	—.61
Putnam	—1.09	—.95	—1.34	—.40	—.92

Randolph	–.41	–.34	–.52	–.39	–.25
Richland	.24	.19	.45	.15	.03
Rock Island	.75	.87	.96	.01	1.06
St. Clair	.81	.82	.51	–.16	1.34
Saline	–.33	.13	.59	.25	–.51
Sagamon	1.55	1.04	1.24	.54	1.43
Schuyler	–.04	–.49	–.86	–.27	–.15
Scott	–.13	–.40	–.53	.09	–.38
Shelby	–.37	–.51	–.81	–.36	–.31
Stark	–.56	–.91	–1.32	–.30	–.57
Stephenson	.52	.39	.49	–.10	.59
Tazewell	.10	.47	.50	–.02	.40
Union	–.52	–.24	–.22	–.21	–.48
Vermillion	.36	.57	.83	.04	.46
Wabash	.32	.43	.87	.29	.12
Warren	.25	.11	.35	.36	–.01
Washington	–1.00	–1.09	–1.65	–.68	–.78
Wayne	–.42	–.50	–.67	–.38	–.37
White	–.23	–.18	–.05	–.01	–.33
Whiteside	–.12	.16	.19	–.18	.09
Will	.68	.78	.58	.08	1.06
Williamson	–.12	.34	.70	.01	–.09
Winnebago	1.12	1.23	1.17	–.07	1.61
Woodford	–.03	–.03	.11	.28	–.19